



# I AM A CYBORG

*Identity, Peripheral Reflexivity and Transhumanism*

Marilou de Haan September 21, 2013

Professor: Michiel de Lange

Second Reader: Joost Raessens

Courtesy of Aubrey de Grey, George Overmeire and Kevin Warwick.



**Universiteit Utrecht**

## **Abstract**

The 1990's seem to be the intersection of several important developments with regard to identity and the human body. In 1991 Anthony Giddens published his book *Modernity and Self-Identity: Self and Society in the Late Modern Age*. In this book he describes that identity in a post-traditional society is no longer a solid thing, but has become reflexively fluid and subject to the question of 'how shall I live?'. In this same period sociology of the body in general is becoming an important subject in sociology. The philosophy of transhumanism also began to truly gain followers in the 1990's. Transhumanism is a philosophy that seeks to transgress certain bodily boundaries. However, since its origins, transhumanism has seen vast changes due to the rapid developments in science and technology, enabling much more advanced bodily modifications. It is clear that transhumanist activities have a great influence on the human body, and since the body and identity are so closely related, the question rises of how the modern (transhumanist) body can be fitted in the theory of reflexive self-identity from Anthony Giddens. From this study it appears that both the theory of Giddens and reflexive embodiment in general, which is a more detailed account of the reflexive role the body plays in modern society, does not fully comply with the transhumanist body. Therefore the concept of peripheral reflexivity is proposed, which stands for the central role the borders of the body now play in identity formation. It is no longer the question of 'how shall I live?', but it has become a question of 'which boundaries do I want my body to have?', with all its consequences.

# Table of Contents

<b>1. High modernity and transhumanism</b>	<b>1</b>
1.2 Structure	2
1.3 Methodology	4
<b>2. Anthony Giddens and the reflexive identity</b>	<b>7</b>
2.1 Reflexivity of high modernity	7
2.2 Giddens' self-identity and the body	9
2.3 Anthony Giddens and his critics	10
2.4 Criticisms on Giddens' body	12
<b>3. Transhumanism from the 1990's</b>	<b>13</b>
3.1 History	13
3.2 The Interviewees	15
3.3 Insights from the Interviews	17
<b>4. Transhumanism today</b>	<b>20</b>
4.1 Technological transhumanism	20
4.1.1 Brain-in-a-vat (mind uploading)	20
4.1.2 Singularity	22
4.2 Cyborg transhumanism	23
4.2.1 Cybernetics	24
4.2.2 Biohacking	24
4.2.3 Molecular manufacturing	25
4.3 Biological transhumanism	26

4.3.1 Biogerontology	26
4.3.2 Body Hacking	27
4.4 Chemical transhumanism	29
4.5 On the side of transhumanism	29
4.5.1 (After)life insurance	30
4.5.2 The mind-body problem	31
4.6 The body in modern transhumanism	31
<b>5. Peripheral reflexivity</b>	<b>32</b>
5.1 Sociology of the body	32
5.2 A new reflexivity	33
<b>6. Conclusion</b>	<b>35</b>
6.1 Reflexivity and transhumanism	35
6.2 Discussion	36
<b>7. Bibliography</b>	<b>38</b>
7.1 Publications	38
6.2 Multimedia	43
<b>8. Appendix</b>	<b>44</b>
8.1 Interview George Overmeire	44
8.2 Interview Aubrey de Grey	59
8.3 Interview Kevin Warwick	63

## 1. High modernity and transhumanism

*The human species can, if it wishes, transcend itself—not just sporadically, an individual here in one way, an individual there in another way, but in its entirety, as humanity. We need a name for this new belief. Perhaps transhumanism will serve: man remaining man, but transcending himself, by realizing new possibilities of and for his human nature (Huxley, 1957, 17).*

The connection between an individual and his or her surroundings is a unique and extremely intimate relationship. Therefore it is not remarkable that changes in society are a very rewarding research object for academics, especially the relationship between society and someone's identity. In order to determine the changes and the effects hereof, society is often divided into different periods, each with their own characteristics. The transition between these periods are often somewhat indistinct and not all academics agree on their definition. In general one could say that the longer ago a period occurred, the more consensus there is on the demarcation of it. Today's society, for example, is a period that is not yet agreed upon. Some people say that we are still part of modernity, some say we have already moved on to a post human condition, but many other definitions have also been coined. One of these concepts is that of late or high modernity.

The concept of high modernity is used to describe a period in the twentieth century in which the faith in science and technology was unwavering. The term is often assigned to the post war era around the 1950's to 1960's, but is also used in more modern writings to describe society today. For example sociologist Anthony Giddens prefers the term of high modernity above that of postmodernity, since the latter presumes that an entirely new phase of social development has arisen. According to Giddens, society is in a phase of developed modernity, still maintaining several of the unifying features of institutions central to modernity (Giddens, 1991, 27). He describes this distinction in his book *Modernity and Self-Identity: Self and Society in the Late Modern Age*. This book describes the new mechanisms of self-identity that modernism has brought forth. Traditionally, the self was a passive entity, determined by external influences. However, in the post-traditional order of modernity (high modernity), it has become a reflexive activity. As Giddens explains it: "Modernity is a post-traditional order, in which the question, 'How shall I live?' has to be answered in day-to-day decisions about how to behave, what to wear and what to eat - and many other things - as well as interpreted within the temporal unfolding of self-identity" (Giddens, 1991, 14).

A concept that seems closely related to the idea of high modernity, is transhumanism. Both concepts have an important link with the early 1990's and they both have the unwavering faith in science and technology. Transhumanism is a philosophy that seeks "the continuation and acceleration of the evolution of intelligent life beyond its currently human form and human limitations by means of science and technology, guided by life-promoting principles and

values.” (More, 1990, n.p.). The term transhumanism was first coined at the beginning of the 19th century, standing for a more general philosophy of the transcending of the human being. This was however not aimed at transcending it in a physical form, but more as upgrading the mental or social attitude of people. After philosopher and futurist Max More founded the Extropy Institute in the 1990’s, transhumanism began to truly gather followers, and gained its more modern definition. This is roughly the same period in which Anthony Giddens introduced his theory on self-identity and high modernity. However, transhumanism has seen quite a large evolution over the past twenty years. As the definition explained, the philosophy often focuses on embracing technology or science to remove certain bodily boundaries, or at least the pursuance of this. Today, the concept of transhumanism is slowly being used for more and more activities in everyday life. This is caused by the fact that science and technology have known such vast progression that there are many more possibilities to remove bodily boundaries, even on a more do-it-yourself (DIY) kind of manner. An example hereof is the current popularity of quantified self, in which people try to transcend their physical or mental capabilities with the aid of technology.

The theory Giddens wrote in 1991 focuses mainly on the social-economical discourse of identity. He did describe the subject of the body, but did not truly address the consequences. Since the body is an important aspect of identity, it is interesting to see how these transhumanist changes to the body relate to an individual’s identity. Since transhumanism has changed immensely the past few decades, this could mean that Giddens’ theory on identity as a reflexive activity is subject to change. To see where this theory and transhumanism stands today, this thesis will juxtapose them and will answer the question: “How does the modern (transhumanist) body fit in Giddens’ theory on reflexive self-identity?”. This study gives insight in the role of the human body in transhumanism today and the effect hereof on identity formation, by using the theory of self-reflexivity from Anthony Giddens as a theoretical framework.

## **1.2 Structure**

To answer the main question, it is of primary importance to determine the theoretical framework. Therefore a detailed account will be given of what Giddens’ theory of self-identity actually entails. In order to do so, the second chapter covers the theory in general, but also looks specifically at the role of the human body in Giddens’ work. With every theory it is also important to look at what other authors have written about it. This means that the second part of this chapter focusses on criticisms on the theory in general and also specific criticisms on the role of the human body.

After explaining the theoretical framework, the next part of this thesis aims at getting a thorough understanding of transhumanism, and especially of the developments it has gone through the past twenty years. A proper overview of these changes, or even of what transhumanism today actually entails, is not truly available. As I will argue later on, most of the

studies available still approaches transhumanism as the philosophy it used to be in the 1990's. Next to this a lot of the literature covering transhumanism focuses on an ethical perspective, such as the article 'Enhancing Who?' from Tom Koch and 'Human Remains: Identity Politics in the Face of Biotechnology' from Annette Burfoot. This is not an unlikely theme, since altering the human body, and possibly therewith prolonging the lifespan of individuals, is an interesting topic for ethics. However, since a good description of modern transhumanism is not available, this study will also answer a subquestion: what transhumanism today actually stands for. This is necessary to get a complete view of what role the body and identity plays in this philosophy, making it possible to critically reflect on Giddens' theory of self-identity.

Answering the subquestion will be done by a thorough study of the available literature, and is complemented by three interviews that have been conducted. These interviews give a better understanding of the perception of individuals closely related to the philosophy. These interviews are not an unwavering source, and will not be used as such, however they do offer a view on modern transhumanism and the developments it has gone through. In the next section the advantages and disadvantages of the chosen methodologies in this study are discussed more elaborately. Since determining the current state of transhumanism entailed a rather large study, this part of the thesis is separated in three sections: the history of transhumanism, the interviewees, and an overview of transhumanism today (which will be in a separate chapter). The historical overview will describe how the philosophy arose and how it developed in its early phase. This will cover the key players, such as Julian Huxley, Robert Ettinger and Max Moore. In the second section the interviewees will be introduced and some of the most important insights are described. In the next chapter the different activities that are considered to be transhumanism today will be discussed more elaborately, including their key players. Since these modern forms of transhumanism have never been mapped and grouped like this before, the overview is made more comprehensible by dividing them into four categories: technological, biotechnological, biological and chemical. These categories should be seen as part of a spectrum, so not as true demarcated categories.

In the final part, before the conclusion, the theory of Giddens and the philosophy will be juxtaposed, based on both the earlier and the modern forms of transhumanism. In this part sociology of the body will also be described more elaborately, and a new form of reflexivity is introduced. This will result in a conclusion in the final chapter, which answers the main question of how the modern (transhumanist) body fits in Giddens' theory on reflexive self-identity.

From this study it appears that the theory of Giddens, and reflexive embodiment<sup>1</sup> in general, do not fully comply with the modern transhumanist body. Therefore this thesis proposes the concept of peripheral reflexivity, which stands for the central role the borders of the human body play in identity formation in today's society. This means that the question 'how shall I live' gets replaced by

---

<sup>1</sup> A concept which will be explained more elaborately in this thesis

the question of ‘what do I want the borders of my body to be’. The Identity formation, and possible corresponding reflexive questions, become of secondary importance and can even be automatically induced by the choices concerning the borders of the body in high modernity.

### **1.3 Methodology**

The chosen methodology for this thesis lies within the area of qualitative research. This means that insights and information coming from existing literature is used as context knowledge. This is contrary to quantitative research in which a hypothesis is formed and tested, based on existing literature (Flick, 2009, 49). The main disadvantage of qualitative research, is that it is harder to replicate, which is an often heard criterion of the reliability of a study. The advantage on the other hand, is that it allows the capturing of subtleties of for example meaning and interpretation of the studied subject (Gray, Williamson, Karp, Dalphin, 2007, 42). That is exactly why this research approach is chosen for this thesis: to get a thorough insight in the meaning and interpretation of the body and self-identity in a transhumanist society. Next to the demarcation of a qualitative research, this study also shows several resemblances to ethnographic research. This is a research approach that focusses on a community or culture. The thorough understanding of self-identity and transhumanism that this thesis endeavors, is approached as a cultural phenomenon. This can not just be done by studying existing literature, since, as Martyn Hammersley and Paul Atkinson place it quite accurately, “[i]t is a distinctive feature of social research that the ‘objects’ studied are in fact ‘subjects’, in the sense that they have consciousness and agency” (2007, 97). Therefore two forms of qualitative research are used: (critical) textual analysis and semi-structured expert interviews.

Scientific research cannot be done without a literature study. The first step in using literature in qualitative research is to get familiarized with the existing writings on the social situation that is being studied (Flick, 2009,49). For this thesis that meant reading up on the existing literature about transhumanism, to know everything there is about the philosophy and the people that are being interviewed. Another important aspect of reviewing the literature, is that it becomes clear what has already been studied and what is missing. This process of familiarizing with the field is also called ‘concept development’ (Gibson & Brown, 2009, 35). During the study for this thesis it became clear that the aspect of identity was often missing from the literature on transhumanism. This was the reason why theoretical literature on identity was also critically reviewed, more specifically the work of Anthony Giddens and his critics. From doing so, it appeared that the developments in the transhumanist body might shine a new light on Giddens’ theory of self-identity.

A downside of literature concerning social accounts, is the crisis of representation and legitimation (Flick, 2009, 76). The former refers to the fact that the relation between text and reality is never a one on one representation, this even goes as far as the reality not only being formed by

the writer, but also by the reader (and thus interpreter) of the text. The crisis of legitimation on the other hand, refers to the earlier mentioned issue of legitimizing the scientific knowledge that is being presented. This point was also raised multiple times in the critical accounts on Giddens' theory of self-identity, which have been analyzed in chapter 2.3 . A downside of literature study in general, is the bias in selecting the documentation. This is influenced by the available resources and the scientific paradigm of the researcher. During this study it is tried to use as many different resources for the literature as available. This covered, amongst others, multiple university libraries, digital systems such as Omega and Google Scholar and other digital resources such as the different online communities on transhumanism.

The second research method that is applied for this study, is that of semi-structured expert interviews. Interviews are extremely useful since they: “allow one to generate information that it would be very difficult, if not impossible, to obtain otherwise – both about events described and about perspectives and discursive Strategies” (Hammersley & Atkinson, 2007, 102). The expert interview refers to the fact that a small group of people is interviewed in a position of representing experts in their area (Flick, 2009, 165). For this study the interviewees were all experts on the area of transhumanism, each from a somewhat different angle. A logical downside of this, is the fact that it can be hard to identify the true expert of a subject. This is something that is hard to avoid, however the selected interviewees were each well known names in their area of transhumanism. The semi-structured interview means that a list of questions is prepared beforehand, but the order and wording can be context specific: depending on the course of the interview. This format was chosen since the approach follows the ‘natural flow’ of a conversation (Gibson & Brown, 2009, 88). This means that the interviewee is not forced to follow a pre-defined question order and furthermore certain (new) subjects can be explored more extensively depending on the course of the interview.

The aim was to conduct the interviews via the online chat program Skype. The advantages hereof, are: the ability to communicate across large distance, the communication is ‘rich’, which means that gestural aspects are also visible (although this is limited to the quality and angle of the camera used) and furthermore the interview could easily be recorded for transcription afterwards. The corresponding disadvantage of the directness of this type of communication, is that the participant has no time to reflect on their answers (Gibson & Brown, 2009, 94). Unfortunately with one of the interviewees, Aubrey de Grey, a Skype interview was not possible, therefore it took place via the asynchronous communication form of email. The largest downside of this is the lack of a proper discussion possibility. This also meant that the interview form changed to a more structured one.

In general there is always one disadvantage of interviews that cannot be avoided, which is the influence of the researcher. Even when a non-directive approach is chosen, the interviewee can

always be influenced by what he or she thinks what the interviewer wants to hear (Hammersley & Atkinson, 2007, 101). Furthermore with the semi-structured interview, it is most likely that the interview will take on the form of a normal conversation, making it hard for the interviewer to remain entirely neutral in all the subtle communication forms. Of course for this study it is tried to avoid this, but entirely doing so is almost impossible. That is why in general al mentioned disadvantages in this section, should be taken into account when looking at the outcome of the research.

## 2. Anthony Giddens and the reflexive identity

Anthony Giddens is well known for his sociological accounts of modern society. In his book *Modernity and Self-Identity*, Giddens describes his theory of a self-reflexive identity in high modernity. As explained in the introduction, high modernity stands for a period in time in which the faith in science and technology was extremely high. For Giddens the changes from the Modern period were not abrupt enough to truly see it as an entirely new area, a discontinuity that does get implied by the term of postmodernism (Walsham, 1998, 1085). A characteristic of this high modernity is the post-traditional nature of its society. Tradition normally ensures that certain life choices do not have to be made, since they are prescribed in customs. In modern society such 'anchor points' for the identity are lacking, which turns the identity in a self-reflexive project (Zhao & Biesta, 2012, 32). This part will explain more about what this theory of reflexive self-identity really entails and the corresponding criticisms.

### 2.1 Reflexivity of high modernity

To better explain his idea of high society, Anthony Giddens has determined three key features in his book *Consequences of Modernity*, which was published one year before his book *Modernity and Self-identity*. The three key features are: a time-space distanciation, disembedding mechanisms (of social institutions) and institutional reflexivity. The time-space distanciation refers to the fact that with the arrival of the mechanical clock time in general has become a universal property, no longer depending on a certain space (Giddens, 1990, 17). An example hereof is that everybody today follows the same calendar, there are no longer countries or cities that work with a different system. This time-space distanciation is the reason why the second key feature of high society can exist: the disembedding of social institutions. This disembedding, stands for the fact that social relations are no longer confined to time or space. A good example hereof, that was not yet prevalent in the 1990's, are chat services such as MSN Messenger or Skype. Today it is possible to communicate or interact with other people, entirely independent of time and space. Both the time-space distanciation and the disembedding mechanisms are enabled by an overall increased trust in abstract systems. This type of systems is a collective term, coined by Giddens, to group symbolic tokens and expert systems under one denominator. The former is a media of exchange with a standard value (such as money), the latter refers to systems that use "technical accomplishment or professional expertise that organize large areas of the material and social environments in which we live today" (Giddens, 1990, 27). These expert systems are also closely related to transhumanism, due to the close relationship this philosophy has with such technology. Trust in general is an important aspect of Giddens' theory on identity and modernity. As he describes it: "Trust of varying sorts and levels, underlies a host of day-to-day decisions that all of us take in the course of orienting our activities" (Giddens, 1991, 19).

The third key feature of high society is the institutional reflexivity. This reflexivity refers to the fact that most aspects of social activities are able to change, caused by new information or knowledge. It is this reflexivity of society and a de-traditionalization of the social order, as described in the first two key features, that gives rise to the need of a reflexive self-identity and promotes lifestyle choices above social constraints (Atkinson, 2007, 6). The identity as a reflexive project is caused by the wide range of choices to which individuals are exposed in this post-traditional society, such as ones appearance, life destination and relationships. Due to this constant reflexive activity, the identity is no longer a fixed entity, but has become fluid and malleable. For Giddens this reflexive process is not something an individual can decide to engage with, it is something that has to be done (Zhao & Biesta, 2012, 336). Changes in Identity are not something new. Giddens refers to the 'rites de passage', which, among others, stands for the transition of adolescence into adulthood. However, in this current reflexive version of modernity, the self has to be explored and constructed in a constant process of connecting the personal and social changes (Giddens, 1991, 33). Reflexivity is also not a characteristic specific to the late modernity. As Giddens describes it: "nothing is more central to, and distinctive of, human life than the reflexive monitoring of behavior, which is expected by all 'competent' members of society of others" (1993, 120).

Giddens also points out several anxieties and consequences of high modernity which directly or indirectly influence ones identity. First of all the radical doubt that modernity has brought forth. Radical doubt is an effect modernity institutionalizes and stands for the fact that all knowledge becomes a hypothesis. As Giddens explains it: "claims which may very well be true, but which are in principle always open for revision and may have at some point to be abandoned" (1991, 3). This radical doubt has of course a great influence on ones identity, since everything should be approached with a certain amount of insecurity. This leads to existential anxiety, in which the individual starts to ask questions such as 'who am I?' and 'what am I supposed to do?'. To answer these questions, and to overcome this anxiety, a narrative is created to accompany the identity. This narrative is a process in which the individual reflexively understands the self by looking at it from a biographical perspective (1991, 53). Giddens calls this the construction of the project of self. The final remark Giddens makes about the influence of modernity on the identity, is that of personal meaninglessness. A psychic problem that, according to Giddens, is common in high modernity, and which causes the individual to feel as if life has nothing worthwhile to offer (Giddens, 1991, 9). Overall Giddens' theory on the reflexive self-identity focusses mainly on a narrative approach, as he explains: "a person's identity is not to be found in behavior, nor – important though this is – in the reactions of others, but in the capacity to keep a particular narrative going" (1991, 54).

## 2.2 Giddens' self-identity and the body

Throughout his book on reflexive self-identity, Giddens also addresses the changing role the body plays in high modernity. In doing so he cites other academics, such as Michel Foucault, Maurice Merleau-Ponty and Erving Goffman. Giddens criticizes Foucault's ideas on the role of the body in identity formation, due to the fact that Foucault sees the body and agency as equated. He even goes as far as saying that the ideas of Foucault are unsophisticated compared to those of Merleau-Ponty and Goffman (Giddens, 1991, 57). Interestingly, Giddens states that bodily discipline, or in other words self-control, is transcultural and not specifically connected to modernity. Furthermore while control over the body is a fundamental way of maintaining the biography of self-identity, the body is also constantly 'on display' to others. According to Giddens this is the reason why bodily integrity is closely related to appraisals of others (1991, 57). This means that issues of disembodiment, which will be discussed more elaborately in a later part, appear. According to Giddens an unembodied self is the characteristic of a dissociation between accepted routines and the individual's biographical narrative. A result hereof is that an individual might be able to undergo assaults on his or her physical well-being more easily than others, since the threats feel as if they belong to another person. However, the price for this is a deep existential anxiety. Disembodiment does however not mean that there is no longer a biographical narrative of ones identity, the narrative just gets woven in a certain manner, allowing the person to observe the body with neutral detachment (Giddens, 1991, 59).

As with the self, appearance was standardized by traditions in pre-modern culture. Giddens explains that in this pre-modern culture, appearance was rather part of a social identity than truly an individual aspect. This does however not mean that in today's society the way someone dresses is completely separate from a social dimension, it still remains a signal of gender, class or status (Giddens, 1991, 99). Next to the direct relationship between an individual and his or her body, Giddens also addresses a more cultural bodily relationship; that of regimes. Regimes are basic organic necessities, such as eating habits or the clothes someone wears. Even though regimes are partially an individual affair, they are always socially or culturally organized. For the self-identity these regimes are of central importance, since they connect the visible presence of the body with habits. Even eating patterns are of influence on the visible appearance of an individual since they can shape the body and can say something about a persons cultural background (Giddens, 1991, 62).

Just like the self, the body in high modernity is no longer a fixed thing, but becomes a fluid and reflexive project. According to Giddens this is the result of an increasing invasion of abstract systems in the body. This also means that the body plays a more important role, since it becomes more relevant to the identity an individual promotes (1991, 218). Unfortunately in the next part of his book Giddens continues on the role of abstract systems and reproduction, which leaves a very

interesting question open: the exact role the body plays in someone's identity in high modernity. Earlier in his book he does raise the question what it means that the body becomes part of the reflexivity of modernity, however he only answers this by saying that the body becomes accessible "to continuous reflexive attention, against the backdrop of plurality of choice" (Giddens, 1991, 102).

### 2.3 Anthony Giddens and his critics

There are several criticisms to be found on Giddens' theory of the reflexive self-identity. First of all it is said that his idea lacks recognition of the influence of a social or moral dimension, furthermore it is said that Giddens' ideas are not specific to high modernity and finally the lack of empirical proof is criticized.

In the article "The Moral Dimension of Lifelong Learning: Giddens, Taylor, and the "Reflexive Project of the Self"", Khang Zhao and Gert Biesta studied the relationship between the lifelong learning theory and that of the fluid reflexive identity. In doing so they address two academics, Anthony Giddens and Charles Taylor. Giddens and Taylor both agree that to make sense of one's identity under late-modern conditions, it is necessary to reflexively and actively work on the self. However, as Zhao and Biesta explain, the two academics have quite a different view on how this should be conceived (2012, 333). This difference can especially be found in the extent to which there should be some social, moral or intersubjective dimension to this reflexive project of the self. Zhao and Biesta point out that Giddens implies that the self "does not operate with reference to external criteria" (2012, 336). Instead it is solely directed by an internal referential system. Supposedly Giddens assumes hyperindividualism and a high degree of individual agency as a result of the changes high modernity has induced. Zhao and Biesta are right that Giddens' theory on the reflexive project of the self, does focus more on an individualistic process, however Giddens does not necessarily sidestep the influence from outside entirely, since for example with the body he does address a social dimension (Giddens, 1991, 99). Matthew Adams also addresses the lack of a moral dimension by looking at the role of fate in the creation of one's identity. Adams says that fate is routinely utilized in the "non-reflexive generation of faith in one's self and one's cultural context" (2004, 402). Contrary to Zhao and Biesta, Adams does not reject Giddens' theory on a self-reflexive identity, he complements it with a non-reflexive cultural dimension that does justice to the moral dimension. He calls this a form of pre-reflexive faith, that comes from the important role that trust plays in the formation of identity. (Adams, 2004, 404).

Another issue in Giddens' theory that is raised by Matthew Adams, is that certain codes of practice from the past are still persistent today, existing alongside "competing and contradictory discourses" (2003, 227), and should therefore not be discarded as not being prevalent anymore. Adams also compares the work of Giddens to a chapter written by Bronislaw Szerszynski, which

was aimed at understanding the effects of modernity. Adams thinks that what Giddens describes as his radical reflexivity would be considered a symptom of today's society by Szerszynski, instead of a solution (2003, 228). Szerszynski focuses on determining the movement from modernity to ecology, in which he argues that: "the contemporary turn to nature has to be seen as merely the latest move - or set of moves - within a peculiarly modern problematic, one concerned with how, in a universe stripped of meaning and purpose, we can still ground behavior and judgements in something more than mere human self-assertion" (1996, 105). This means that the problematic, that of (late) modernity, is similar among Giddens and Szerszynski, however Giddens focuses more on the effect of it on identity. It might be true that radical reflexivity would be considered a symptom by Szerszynski, however, since the quite distinct nature of both articles, in which Giddens focuses on the effect of modernity on identity and Szerszynski tries to find a solution to the consequences, the juxtaposing of the two in this manner (as Adams does) might be questionable.

The fact that Giddens has no true empirical proof for his 'assumption' is a criticism that is also heard more often. David Buckingham states that it is by no means determined that the processes Giddens describes are distinctive to high-modernity, or whether they apply to the majority of society (Buckingham, 2008, 9). He supports this claim by comparing Giddens' theory to that of Michel Foucault. Foucault, a philosopher and social theorist born approximately half a generation before Giddens, has also written extensively about the effects of modern society. For Foucault a reflexive project of the self is not an ultimate goal, instead identity in general is another way to exercise disciplinary power. As Foucault states: "The individual with his identity and characteristics is the product of a relation of power exercised over bodies multiplicities movements desires forces" (1980, 74). By comparing Foucault with Giddens, David Buckingham underpins his statement, that while looking at the same issue, modern society, the conclusion on the effects thereof on identity can be entirely different. This means that according to him empirical proof is needed to determine whether Giddens' ideas on the reflexive self are specific to high modernity. However, Giddens himself also states that reflexivity in general is not specific to high modernity, and prevails in society throughout the ages (1993, 120). David Gauntlett also addresses this criticism of lack in empirical evidence in his book *Media, gender and identity: an introduction*. However, instead of pointing it out as a fallacy, Gauntlett has done his own empirical study, called 'the lego identity study' to see what exactly can be proven. As he explains it himself, he tried to make identity issues "more tangible" (Gauntlett, 2008, 109), and asked 79 different individuals to create metaphorical lego models of their identity. This showed that Giddens' biographical approach of self-identity actually held true when studied empirically.

## 2.4 Criticisms on Giddens' body

The criticisms people have placed upon Giddens' work concerning the body, are fairly similar to the ones mentioned above and can be divided into three separate types: the lack of a social dimension, no empirical proof and ignoring the sensory dimension. Two of them are described by Ian Burkitt in his book *Bodies of Thought: Embodiment, Identity and Modernity*. Burkitt states that the two main issues concerning the body in Giddens' theory are the lack of a social dimension and the fact that there is no proof that this is a typical thing for high modernity (1999, 141). The former is also described by Dennis Crossley. According to Crossley, Giddens does address the fact that the body becomes malleable due to the changes in modernity, and does point to a form of reflexive embodiment. The issue, however, is that this bodily reflexivity is seen too much as separated from a social dimension. To solve this issue Crossley proposes a more interactionist approach to reflexive embodiment, to do justice to the large social aspect of the body, since people are inherently social, or as Crossley explains: "we are born into groups" (2006, 26). He derives his ideas mainly from the work of sociologists Charles Cooley (1864-1929) and George Herbert Mead (1863-1931), since concerning to Crossley the more modern theories such as those of Giddens and Foucault are not sufficient.

The other issue with Giddens, that reflexivity might not necessarily be caused by high modernity, was also mentioned above with the criticized lack of empirical evidence. An entirely new criticism however, is related to the mind-body dualism. According to several authors, Giddens ignores the sensory dimension. As Shelley Budgeon states: "Giddens's analysis of the body and self relationship is open to three main criticisms: the conceptualization of the mind and body relationship as a binary; a privileging of mind over body; and a blindness to the gendered nature of this binary" (2003, 37). The same issue is raised by Peter Freund about earlier ideas of Giddens, explaining that the sensory and physical dimensions also play a structuring role (1988, 84).

It might seem that with so many criticisms, using this theory as a starting point would be illogical. There are indeed some questions that might be raised, however Giddens' theory primarily addresses the fact that there are significant shifts, in high modernity, in the way in which identity is formed and experienced. This is an important development since in the same time the relationship between a person and his or her body, especially with transhumanist activities, has also seen significant changes. Another reason why this theory is so apt, is that Giddens describes certain aspects of high modernity, such as the trust in complex systems, which is even more prevalent with the transhumanist ideas that will be discussed in the next part.

### 3. Transhumanism from the 1990's

This chapter is aimed at introducing the transhumanist philosophy. Therefore a historical overview is offered and the interviewees are introduced, together with some key points that have arisen during the interviews. As explained in the introduction, transhumanism today is much broader than the original philosophy. This is the reason why the modern form of transhumanism is separated from this more historical overview, and will be discussed in the next chapter.

#### 3.1 History

The concept of transhumanism was first coined in 1927 by the biologist Julian Huxley, as a new form of enlightenment philosophy. Julian Huxley is the brother of famous writer Aldous Huxley, well known for his book *Brave New World*. In this book, published in 1932, he describes a future dystopia where scientific and technological possibilities make up the social equilibrium. It is not entirely clear whether the brothers have influenced each other in their topic of interest, however the similarities in subject between them is quite striking. It must be said that in the famous novel, science and technology are not exactly used to enhance human capacities. Julian Huxley wrote about transhumanism more elaborately in his book *New Bottles for New Wine*. In which he describes the course of human development and the fact that the time has come for humans to step up their game. Or as he calls it: "It is as if man had been suddenly appointed managing director of the biggest business of all, the business of evolution" (Huxley, 1957, 13). Huxley's exact definition for the transhumanist movement was also stated in the introduction: "man remaining man, but transcending himself, by realizing new possibilities of and for his human nature"<sup>2</sup> (Huxley, 1957, 17).

Even though it were not the ideas of Julian Huxley that led to the immediate emergence of the transhumanist movement, he was right in adopting the concept for a new form of enlightenment. The Age of enlightenment brought forth several great thinkers, such as Isaac Newton and Immanuel Kant, who formed the basis for rational humanism. Rational humanism is a philosophy that, instead of revelation and religion, emphasizes on critical reasoning and empirical science (Bostrom, 2005, 2). Transhumanism shows some resemblance with the humanist philosophy; they have several core values in common, for example concerning the primary focus on the individual and concepts such as freedom, fairness and equality. The biggest difference, however, is the radical approach transhumanists adopt. As philosophical anthropologist Jos de Mul states it, transhumanists 'radicalize the humanist pursuit [...] to a call for self-transcendence of the human

---

<sup>2</sup> It is quite striking that this description emphatically states that the transhumanist would be male. This political distinction is not further explored in this thesis, however even in the comments on the documentary *Biohackers*, a concern is placed on the possible discrimination of the female biohacker <http://technocult.net/archives/2012/08/10/short-documentary-on-the-diy-bodyhackingtranshumanist-underground/>.

biological species” (2002, 346). For example death is not seen as natural, and therefore accepted, it is seen as a disease that can be cured by progress in science and technology.

As stated above, it were however not only the ideas of this biologist that would eventually lead to transhumanism as it is known today. Another key figure, well known by transhumanists, is cryonics pioneer Robert Ettinger. Ettinger was a wounded World War II veteran who was trying to channel his dissatisfaction with the human body (Gelles, 2008, 36). Today Ettinger is mostly well known for his ideas on cryonics, the freezing of bodies to be revived when technology is adequate. Next to this, he also wrote an article in 1972 on the subject of transhumanism, called ‘Man Into Superman: After Immortality [...] Comes Transhumanity’. In this he proposes the development of technology not to revive the dead, but to make death altogether obsolete. In the end, Ettinger was still not the person to truly assemble supporters for the transhumanist philosophy.

The biggest catalyst for modern transhumanism is philosopher and futurist Max O’Conner, who later on changed his name to Max More, to remind him of a continuing progression. For his ideas to be spread, he coined the concept of extropy, as the opposite of entropy. Extropy stands for several things, such as growth, diversity and intelligence (More, 1995, n.p.). Max More founded the Extropy Institute in 1992 together with professor Tom W. Bell<sup>3</sup>, and soon it began to gather several followers, calling themselves extropians. Four years earlier Max More already published the first transhumanist journal called *Extropy: The Journal of Transhumanist Thought*, which lasted until 1996. As it states in one of the revised versions of his Extropian Principles, according to More’s definition, the philosophy “provides an inspiring and uplifting meaning and direction to our lives, while remaining flexible and firmly founded in science, reason, and the boundless search for improvement” (More, 1995, n.p.). Eventually the followers were calling themselves transhumanists, however, the American branch is still often referred to as extropianism. In the end the Extropy Institute did not manage to keep pace with the maturation of the philosophy and transhumanism began to embrace the Internet as their main platform (Gelles, 2008, 37). Which still holds true today. Where mailing lists used to be the main information source for transhumanism, today it mostly revolves around the social network Facebook. The only active organization, that still has active members and that continues to exist today, is Humanity+. They organize events every now and then and they publish a magazine<sup>4</sup>.

The organization Humanity+ was founded by Nick Bostrom and David Pearce in 1998, and aims at “elevating the human condition” (Humanity+ Mission, n.d., n.p.). Originally it was called the World Transhumanist Organization (WTO), but later on the name was changed to Humanity+. Humanity+ does not promote a clear and distinct definition of what transhumanism means, but

---

<sup>3</sup> Tom W. Bell later on changed his name to T.O. Morrow

<sup>4</sup> Which, to be honest, has become more of a blog than a true magazine the past few years, after it started as a web-only publication in 2010

mostly poses itself as being a platform for info on emerging and speculative technologies. They do have adopted the *Transhumanist Declaration* that was drafted in 1998 by authors from both the Extropy Institute and the WTO. This declaration describes some key values of transhumanist philosophy. Humanity+ was responsible for the organization of the first transhumanist conferences called Transvision, of which the first one took place in the Netherlands in 1998 and the last was in 2007.

There is a large difference between the ideas on transhumanism by Julian Huxley and those of Max More. Julian Huxley believes that just as we have explored and revealed geographical sides and are able to create more favorable physical environments, humans should now focus on creating a more favorable social environment. True human destiny should be created by exploring all the possibilities of human beings. Or as Huxley calls it “[a] vast New World of uncharted possibilities awaits its Columbus” (Huxley, 1957, 14). When this new world is conquered correctly, Huxley thought that every human being would know true satisfaction. His ideas are perhaps more based on a general transcending of the human species, more socially than physically. The extropian approach to transhumanism, by Max More, introduced the idea of transhumans being the stage between the human and the posthuman, aiming at lifting the physical boundaries and creating an indefinite lifespan. These extropians were especially excited about nanotechnological possibilities for indefinite longevity and has a more political dimension, often aligned with anarcho-capitalism<sup>5</sup>. (Hughes, 2012, 763).

### 3.2 The Interviewees

In order to better fathom the concept of transhumanism, three interviews were conducted. All the interviewees were selected based on their work and ideas concerning transhumanism. Since this study looks at both the early transhumanism and the different forms of it today, the interviewees were also selected for their different areas of expertise. In this part they are introduced and an overview is offered of their work. The interviews have been conducted by Skype, only the interview with Aubrey de Grey was carried out by email, due to the lack of better channels of communication. The entire transcripts can be found in the appendices in chapter eight. These interviews have been of vast significance for the true understanding of transhumanism, however they offer a perspective and are not leading or conclusive. They are often used during the description of transhumanism today, to emphasize or guide certain examples.

The first interview was done with Dutch transhumanist George Overmeire. George Overmeire, a teacher at a high school, is especially known for his online presence among the transhumanist philosophical community. Next to this he is the first in the Netherlands to have a cryonics contract and was actually responsible for making this possible in this country. Overmeire has been part of

---

<sup>5</sup> a political philosophy that favors private enterprise in a free market above the state.

transhumanism for quite some time and was present at the first Transvision. In the beginning, when transhumanism mainly took place in mailing lists instead of organizations, he was already highly active. When the first Dutch organization was established, he was approached to join it for his active participation on other platforms. He started several websites for this philosophy, including the Dutch website [transhumanisme.nl](http://transhumanisme.nl), offering general information. Next to this he maintains websites on Cryonic Suspension ([cryonicsuspension.info](http://cryonicsuspension.info)), space colonization ([ruimtekolonisatie.nl](http://ruimtekolonisatie.nl)) and objectivism ([objectivisme.nl](http://objectivisme.nl)). All these websites are still updated quite regularly. Next to his active participation in the Dutch and international transhumanist movement, he also participates in the Dutch division of Mars Society, an organization that aims at further exploring and settlement of the planet Mars. George Overmeire is a good example of a supporter of the early transhumanist philosophy. The interview was held in Dutch and therefore the transcript is also in Dutch. Whenever a quote is used in this thesis it is translated to English. The interview can be found in appendix 8.1.

Aubrey de Grey, the second interviewee, is a well known biomedical gerontologist. He started in the field of computer science, but switched to gerontology in the 1990's. Gerontology is a comprehensive multidisciplinary study of the biological, social and psychological aspects of the process of aging (Association of Gerontology, n.d., n.p.). Today Aubrey de Grey is Chief Science Officer at the SENS foundation, a charity founded by, amongst others, himself. SENS stands for Strategies for Engineered Negligible Senescence, which is the plan de Grey has conducted to repair the damage that aging does. This plan entails breaking the aging process down in seven damage classes, and it offers approaches to address each one (SENS, n.d., n.p.). Aubrey de Grey has written many publications on the subject of aging, including the more ethical side, and also on other somewhat related subjects such as caloric restriction. He sees aging as amenable for medical intervention and therefore believes that within 30 years it might be possible to rejuvenate an individual of fifty years old to allow him to reach the age of 130. This can eventually lead to Longevity Escape Velocity (LEV), or as de Grey calls it "just a very obvious side-benefit of my work" (Q18, 62). LEV stands for the point in time where the therapies to rejuvenate people will extend someones health span long enough to stay one step ahead of illnesses (de Grey, Q18, 62). Overall Aubrey de Grey is a well known name amongst transhumanists and a frequent speaker on events around this philosophy, even though he does not truly feel like one himself (Q2, 59). The interview with Aubrey de Grey can be found in Appendix 8.2.

The third interviewee is cybernetics professor Kevin Warwick, who is most famous for his work on direct interfaces. In 1998 Warwick was the first person ever to implant a RFID chip in his arm, with which he could open doors and turn on lights whenever he would enter the university building. In 2002 he took this journey to become a cyborg even further, when a one hundred electrode array was surgically implanted in his arm. It was connected to his nervous system whereby

Warwick was able to control certain electronic objects such as an intelligent artificial hand (Warwick Cyborg, n.d., n.p.). Most strikingly was the case in which his wife also had a similar implant, and they were connected to each other's nervous system. This actually gave him a place in the 2003 edition of the Guinness World Records Book, since it was the first direct electronic communication between two nervous systems (Warwick Home, n.d., n.p.). Warwick is quite actively involved with transhumanism as an activity (not as a philosophical movement); he is, for example co-author of the book *Transhumanism: Robots, Cyborgs and Artificial Intelligence* and recently released the book *I Cyborg*, in which he describes the road he has taken to become a cyborg. His publications mostly focus on the close human-computer interface, however also focussing on the curing of diseases such as Parkinson's disease. Warwick is a frequent speaker at transhumanist events. However, just as with Aubrey de Grey, from the interview it appeared that he does not truly see himself as a philosophical transhumanist. The interview with Kevin Warwick can be found in appendix 8.3.

### 3.3 Insights from the Interviews

While the interviewees might differ quite a bit in their background, a similar point seemed to come to the surface in each interview, on how transhumanism has changed over time. George Overmeire gave a clear description of how the organization of transhumanism has changed over the years. He explained that it first was a more globally organized group and that gradually it became more or less decentralized, evolving into smaller groups supporting different 'forms' of transhumanism.

Overmeire gave an example of people who were trying to get a cryonics contract. At first there seemed to be a lot of attention for it, but once it was made possible to arrange such a contract in the Netherlands, the interest started to decrease, eventually leading to the separation of the cryonics group from the transhumanist mailing list (Overmeire, Q5, 47). Next to this Overmeire mentioned the influence of websites such as Facebook on the transhumanist organization, a development he does not truly support. He prefers the closer contact that transhumanism used to offer, and thinks that these online developments also account for quite some pollution in the information that is available, or at least a decrease in the quality of it (Overmeire, Q9, 50).

In the interview with Aubrey de Grey, it became first apparent that people who are generally labeled transhumanists, do not necessarily feel like one. De Grey also explained that even though he does not see himself as a transhumanist he is more prone to the ideas of Julian Huxley than those of Max More. In his opinion transhumanism is a philosophy that promotes the improving of the quality of life by expanding the capabilities and environment of human beings (de Grey, Q4, 59). So even though he calls himself a practical first-things-first type of guy (de Grey, Q2, 59), he does know quite some things about the philosophical background of transhumanism. Kevin Warwick gave a similar description of his relationship with transhumanism. He also stated that he is more practical and technological, however Warwick, contrary to de Grey, is not so much familiar with the

details of the philosophical side of transhumanism. He does emphasize that being labeled a transhumanist is not his choice (Warwick, Q8, 66).

All three interviewees had a somewhat different view or description for what transhumanism means. However, when asked what defines someone to be ‘a transhumanist’, there was some overlap in their answers. According to George Overmeire this is someone who is willing to actively take steps towards upgrading the human body. He does admit that ten years ago, he would only have called someone a transhumanist when they thought along and had an open mindset for the possibilities (Overmeire, Q14, 52). Aubrey de Grey stated that he thinks it is someone that has an interest in extrapolating technology into the future, and thinks that someone working on advanced prosthetics might or might not be a transhumanist (Q5, 60). Kevin Warwick finds it somewhat hard to explain what he thinks a transhumanist is, however he does focus more on the practical side than the philosophical. He explains this by discussing what a cyborg means for him, which to him is someone with integral technology that enhances him or her (Warwick, Q5, 65). In this definition, according to Warwick someone with a prosthetic is not necessarily a transhumanist, but it does open up certain possibilities to explore the upgrading of the human body (Q7, 66). What all three interviewees have in common on this subject, is that they all state that it has more to do with the activities the person does, than with the way he or she thinks. Even though Aubrey de Grey does lay the connection to the interest someone has, in the rest of the interview he does focus on the practical interpretation of transhumanism. George Overmeire explained that he actually had a shift from a more philosophical perspective on transhumanism to a more practical one.

All three interviewees also stated that transhumanism today is far more accepted than when the philosophy first occurred, some even go as far as calling it mainstream. George Overmeire gave the best description of this change, explaining that when he first joined transhumanist mailing groups, people would call him crazy (Q1, 44). Today people react in a different manner, they accept it more or less and are not rejecting the ideas beforehand. Overmeire thinks that this is caused by the advances in, for example, the successes in therapeutic cloning, of which people also used to say that it was impossible and today they are confronted with the possibilities in magazines and television shows all over the world (Q12, 51). Aubrey de Grey said that transhumanism is becoming more mainstream, since people like Ray Kurzweil<sup>6</sup> are becoming more popular every day (Q8, 60). He also explained that the acceptance of cryonics is changing quite a lot compared to ten years ago (de Grey, Q16, 62). Kevin Warwick gave the example of mind uploading which has become ‘much more realistically grounded’ (Q11, 68), now that there is more scientific proof to back up these ideas. Finally also in the interview with Kevin Warwick it became especially clear that the shift in mindset mainly took place the last ten to fifteen years. He describes that transhumanism fifteen years ago was considered a weird group of people, whereas today people write about it in

---

<sup>6</sup> An inventor and futurist who is well known for his technological predictions.

newsthesiss. Warwick explained that when he got his neural implant in 2002, newsthesiss did not dare to write about it. He quotes the science reporter of the Telegraph at that time as saying: “look, I know what you are doing Kevin, but our readers they are going to find this so way out there” (Warwick, Q9, 66).

## 4. Transhumanism today

This study also seeks an answer to the subquestion of what transhumanism today actually entails. This question is highly important, since it is necessary to truly fathom the role of the human body in the philosophy today and the possible changes it has gone through the past two decades. A thorough understanding of this community and the role of the body, makes it possible to critically reflect on Giddens' theory of self-identity. To answer this subquestion, the activities that are currently considered to be transhumanism have been studied. In order to make the overview more comprehensible, they are divided into four categories, technological, cyborg, biological, and chemical, each with their own ideas and dreams. The next four parts are going to focus on these different categories starting with the technological. In the final part some other relevant aspects of modern transhumanism are described and a short summary of the role of the human body in modern transhumanism is given.

### 4.1 Technological transhumanism

Technological transhumanism might seem like the most logical form of transhumanism, since it is often technology where transhumanists believe in, as the way in which the limitations of the human body can be lifted. However technological transhumanism in this sense is not only the idea that technology will help overcome certain bodily limitations, it is the ultimate goal; not only aiding the human body, but entirely transcending it. Two current examples hereof are mind uploading and singularity. The similarity between them, is that both imply leaving the entire human body behind. This does not go without implications. An often heard issue is for example the connection between mind and body, but also other philosophical questions concerning disembodiment arise. Since the body plays an important role in identity formation, especially in maintaining the biography of self-identity, a form of transhumanism in which the entire body is bypassed by technology, is a very interesting perspective in the light of Giddens' theory. In this part an overview is given of the ideas behind these technical transhumanist approaches.

#### 4.1.1 Brain-in-a-vat (mind uploading)

*"Nope. They're born meat and they die meat. We studied them for several of their life spans, which didn't take long. Do you have any idea what's the life span of meat?" (Bisson, 1991, 54).*

This quote comes from the Nebula Award-nominated short story 'They're made out of meat', which has become a classic in the science fiction genre. In this short story two sentient creatures from out of space are on a mission to welcome any life form they find in this specific quadrant of the universe. They are astonished by the discovery of creatures made entirely out of meat, which do have cognitive capabilities: "[y]es, thinking meat! Conscious meat! Loving meat. Dreaming meat.

The meat is the whole deal!” (Bisson, 1991, 54). In the end they decide to erase the discovery of the entire planet, because ‘who wants to meet meat?’ (Bisson, 1991,54). This story gets often mentioned online when discussing the transhumanist dream of mind uploading; it shows that the meat is weak and technology is superior. For certain transhumanists this is also their future dream. It is quite an extreme form of this philosophy since the human body becomes entirely obsolete. However, the goal of this mind uploading differs amongst the different followers. Some prefer a future where robotics are the new humans, with the human mind uploaded, others pursue an immortal life even further distanced from the real world, which would take place in virtual reality. Second life is for example a platform that is often praised as being the first steps towards this uploaded virtual life.

The case of mind uploading does however pose some questions concerning philosophical dilemma’s. As George Overmeire also explains, for him mind uploading is not an ultimate goal since he would have to face the mind-body problem. He does believe that it is possible to transfer oneself to an emulation, however the biggest issue would be: “in principle the person that would awake, if it is a true one-on-one emulation, would be me, but is it truly me?” (Overmeire, Q13, 52). In part 6.3 this problem will be addressed more elaborately. Kevin Warwick on the other hand, wants to see more proof of mind uploading actually working, but he does acknowledge the possibilities: “well who needs your body? I mean it is just a bloody waste. It’s a pain in the neck, you don’t need a neck! It’s a pain in the brain!” (Warwick, Q15, 71).

An example of someone working on mind uploading is neuroscientist Kenneth Hayworth. Hayworth is trying to find a way to upload the human mind to a computer in order to later download it onto a robot again. He tries to do so by ‘shaving’ the brain into tiny slices (as thin as 30 nanometers) in order to be imaged in an electron microscope. Combining many thousands of these images will result in a highly detailed three dimensional map of a brain (Goldstein, 2012, n.p.). His work falls under a specific branch in neuroscience called connectomics, which focuses on the mapping of the functioning of the human brain (connectomes). The theory behind Hayworth’s research is that connectomes are what makes somebody a specific person. This idea is explained more detailed by computational neuroscientist Sebastian Seung in his TED talk ‘I am my connectome’. The idea is that the many synaptic connections between neurons contain for example someones memories (Seung, 2010). This thought comes from the fact that the connections change overtime. Part of this is programmed by our genome, but the other changes are caused by the environment. Even identical twins have different connectomes.

Uploading the human brain to a virtual reality is also called cybernetic immortality. A practical example of this idea is the non-profit organization of neuroscientist Randal A. Koene, called Carbon Copies. This organization focuses on whole brain emulation, which would result in so called substrate-independent minds (SIMs), providing the ultimate adaption for humans. As Koene

states: “[a]t a survival level, a SIM could be embodied in a variety of ways, and so would [sic] perhaps be better able to survive potential societal collapse. At a human level, the goal would be continued existence of personality, individual characteristics, a manner of experiencing and a personal way of processing experiences. Continuity of self could be assured, despite minds having novel embodiments.” (2012, 26). He emphasizes the fact that it is an emulation, which means an exact copy is used, while simulations, such as the Blue Brain Project, indicates the building of a general model based on how the brain could work (Koene, 2012, 26). Physicist and computer scientist Giulio Prisco<sup>7</sup> is someone that advocates this type of transhumanist future quite clearly. On his website Turingchurch.org he publishes regular articles on several subjects concerning transhumanism. According to him it is time to become ‘Cyber Angels’ (Prisco Angels, 2012, n.p.). A more practical application of mind uploading is also mentioned by Giulio Prisco, in the form of uploading astronauts for interstellar missions. This would cut down the costs since it is no longer necessary to ensure the safety of the humans onboard (Prisco Uploaded, 2012, n.p.). Kevin Warwick gave a similar preference to a robotic body, since it would open up the possibility for him to go into space. He thinks that his age might prohibit him in his current embodied state (Q26, 76). In the Humanity+ survey from 2007 80% of the respondents stated that they were willing to upload their mind, if it was the only possible way to remain a conscious person (Humanity+ Report, 2008, 3).

The ideas on mind uploading have been a fruitful subject for science fiction for many years. Perhaps the most well known example hereof is the *Matrix* trilogy that started in 1999. However, other examples can be found throughout several generations of science fiction, for example *The Ship Who Sang* is a novel by Anne McCaffrey, describing a heavy disabled woman whose brain gets placed inside a ship, which she could then control. This is a very literal form of brain uploading; placing the entire brain in the machine. Another famous example from the film industry is Disney’s *Tron*, which was released in 1982. In this movie a computer programmer gets into the software of a computer to prove the theft of some video games. The movie even got a sequel nearly twenty years later: *Tron Legacy*. Finally, in the famous *Sprawl Trilogy* by William Gibson (also known as the *Neuromancer*, *Cyberspace*, or *Matrix* trilogy), there can be found examples of many forms of transhumanism that are described in this thesis. For example in the form of cybernetic implants and the next form of technological transhumanism: singularity.

#### **4.1.2 Singularity**

Where mind uploading might differ between uploading the brain to virtual reality or to a different (robotic) body, singularity focuses more on creating entire new life forms. Or as stated on the

---

<sup>7</sup> On Wikipedia his title is more impressive, being described as “an Italian information technology virtual reality consultant; as well as a writer, futurist, and transhumanist” (Wikipedia, n.d., n.p.).

website of singularity: “Singularity is the technological creation of smarter-than-human intelligence” (Singularity Institute, n.d., n.p). The first ideas about singularity were written down by mathematician and science fiction author Vernor Vinge in 1993. Strikingly enough he stated in his definition that it would not only entail greater than human intelligence, but also the possibility of improving itself, eventually leading to the end of a human-directed history (Hughes, 2012, 763). Inventor Ray Kurzweil is one of the most prominent Singularitarians. He is especially well known for his predictions concerning technology, of which many appeared to have come true. He makes his predictions by exponential technological progress, which means using certain ideas such as Moore’s law, to predict accelerating developments. According to Moore’s law the amount of transistors that can be fitted on a microchip will double approximately every eighteen to twenty-four months (Yiu, 2012. 10). Kurzweil predicted that by 2050 the human and machine consciousness will be fused into an “intelligent explosion” (Hughes, 2012, 764). However in the latest Humanity+ survey only 31% of the surveyed thought such an abrupt cataclysmic change would actually happen around 2040 (Humanity+ Report, 2008, 12).

The most logical, or at least the most well known, platform for singularity is artificial intelligence (AI). However, the same goal can also be achieved by for example direct brain-computer interfaces or biological augmentation of the brain (Singularity Institute, n.d., n.p.). This also shows that the distinction between different approaches to transhumanism is a true spectrum and that they are not clear demarcated categories. George Overmeire explained that the dream of creating smarter-than-human intelligence might pose some future risks, especially with the hard singularitarians; “people who have conceived that AI will eventually go as far as to become an independent movement of a race of which we people can only hope that we won’t suffer from, or will integrate with it” (Q8, 50). As sociologist and bioethicist James Hughes states, many transhumanists are skeptical about the future control of those intelligent machines (2012, 764). Most singularitarians have a ‘left behind’ expectation when it comes to the merge with super intelligence (Hughes, 2012, 764). It is therefore quite a strange philosophy to espouse, since it would lead to the extinction of humans. However, this somewhat relates to the more extropian vision on transhumanism in which the transhuman is merely an intermediate state to the posthuman. The eventual question would be, who is going to be lucky enough to merge into such a symbiosis?

## **4.2 Cyborg transhumanism**

Although cyborg transhumanism might in many situations seem like a pleonasm it is possibly the best way to describe this stage between biological and technological in the transhumanist spectrum. Cyborg transhumanism entails the bridge between the two ‘extremes’. It strives for the human body (biology) to be augmented or aided by technology, however, there is no preponderance of either one. Examples hereof are cybernetics, biohacking and molecular manufacturing. These cyborg

combinations of biology and technology, almost seem to be the most concrete example of what Giddens calls the invasion of abstract systems in the body, which would be the reason why the body in high modernity is no longer a fixed thing. Especially with cybernetics this is the case, as will appear from the following section.

#### **4.2.1 Cybernetics**

Similar to these augmentations of the human body, is the practice of cybernetics. Cybernetics is not a new idea; mathematician Norbert Wiener first wrote about it in the mid twentieth century. In doing so he describes it as “the entire field of control and communication, whether in the machine or in the animal” (Wiener, 1961, 11). It is a study of systems and Wiener’s focus lay on feedback mechanisms. This type of study offers a better understanding of multiple processes in life, both technological and biological. Wiener was perhaps not directly a transhumanist, however he did explain that there are three models of the human body connected to three different stages of automata. These are the age of clocks (17<sup>th</sup> and 18<sup>th</sup> century), the age of steam (late 18<sup>th</sup> and 19<sup>th</sup> century), and the age of communication and control (started mid 19<sup>th</sup> century) (Wiener, 1961, 39). Connected to these are the three different models of the human body which are being recreated as automaton, the first is the human body as clockwork, the second sees it as a heat engine and the third is the body as an electronic system (Tomas, 1995, 23). This latter body seems to become true reality with the arrival of cyborg mechanics.

A well known professor in Cybernetics is interviewee Kevin Warwick. He has done several almost science fiction-like experiments with prosthetics and implants. As stated in the introduction of the interviewees, he was the first person in the world to have a RFID chip implanted in his arm and later had a futuristic implant connected to his nervous system. During a video interview with Infomania, Warwick stated that it is estimated that humans only sense five percent of everything and with electrodes this could be enhanced (Infomania, 2008, n.p.). This is exactly where cybernetics (and biohackers alike) are interested in. It is all about enhancing the human body by using electronics. With cybernetics this is a scientific process, in which the experiments are mostly done by professional surgeons. However, as a professor, Kevin Warwick has several students who might rather be seen as biohackers.

#### **4.2.2 Biohacking**

Biohacking is the idea of adding technology to the human body to achieve small improvements. The biggest difference with cybernetics is the fact that this is often done in a DIY style. Possibly most known for this is biohacker Lepth Anonym, who keeps track of every augmentation on her blog, and shares pictures, experiences and advice. Anonym mainly tries to implement small things underneath her skin, such as magnetic disks or, as she is working on now, a compass. On the

frequently asked questions of her blog she explains why she does it: “I’d like to say I did it because I follow a grand tradition of self-experimenters in science, or that it was because practical transhumanism is more than a philosophy to me (it’s my life), but at least partly, I did it for kicks. I just wanted more senses; still do.” (Anonym, 2010, n.p.). This is not very surprising since this type of transhumanism is quite closely related and often linked to body modification. In America getting an implant is actually possible at certain tattoo or piercing studio’s. This was also shown in the short documentary on biohackers, made by The Verge. In this documentary, *Biohackers: A Journey into Cyborg America*, three biohackers are being pictured in their daily activities. One of these biohackers, Shawn Sarver, asks himself, “how much can I consciously evolve the human body — to do it more, do it better, do it faster, do it stronger? I just want to see how far I can push the human” (Verge, 2012). This does show the fine border between transhumanism and certain other body modifications, since he later on explains: “there is a self destructive esthetic, or quality about it, but that is not the head for everyone” (Verge, 2012).

The students of Kevin Warwick on the other hand, do use these types of implants for scientific studies. In his talk, for the *TEDxWarwick* event, Warwick states that his students have made several devices that could be connected to a type of magnet that is often implanted by biohackers in their finger(s). For example one student created a hat with an infrared sensor that was connected to a coil around the finger. With this hat it became possible to ‘feel’ the heat of an object, due to the changes in the vibration of the magnet in the finger. This might be reminiscent to the already existing infrared binoculars, however the direct interface of it is unique. It is perhaps uncertain what form this interface might take on, but the possibilities hereof are already enormous. One problem with biohacking is that the term is somewhat vague, especially since it is also used for the activity of hacking biological material. This entails people that change biology in a more hobbyist or artistic activity, for example inserting poetry into a microbe’s DNA (Loukides, 2012, n.p.). These cybernetic bio hackers therefore also often call themselves grinders.

#### **4.2.3 Molecular manufacturing**

When George Overmeire was asked about the acceptance of transhumanism, he gave the example of nanotechnology. Overmeire explained that the ideas about this have already been an optimistic topic among transhumanists for years, and that just recently they have become somewhat more ordinary for other people (Q3, 47). The nanotechnology transhumanists endeavor is however not quite the same to that which is known by most. Therefore the regularly used term is molecular manufacturing or molecular nanotechnology. This type of research focuses on the possibility of creating exact copies of an item, or building something of extreme atomic precision, by building it

atom for atom (IMM, n.d., n.p.). This would mean that a device such as the replicator from *Star Trek*<sup>8</sup>, could become reality, but it also can mean huge advances in medicine.

The idea of little robots going through the human body to cure certain diseases, does probably still sound quite futuristic, however not as much as it used to do fifty years ago, since nanotechnological possibilities have already come to such a height. Strikingly enough, as George Overmeire also stated, in science fiction these ideas already have been around for quite some years. Overmeire gave the example of well known author Isaac Asimov who wrote about this type of robots in his novel *The Fantastic Voyage* from 1966 (Q3, 47). This type of robots could be used in the medical world to find and fix certain flaws inside the human body. This could for example be removing a carcinoma or to perform certain precise surgical operations. Molecular nanotechnology focuses on the use of technology to enhance the human body. However, contrary to cybernetics, the intention for these technologies is to leave the body after the work is done; it does not entail a true body modification. This means that this type of transhumanism moves closer to the biological form of transhumanism on the scale.

### **4.3 Biological transhumanism**

Next to technological transhumanism the logical other ‘extreme’ on the scale is the biological approach. As already explained, the distinction is a scale, so there is some resemblance with molecular nanotechnology. In this thesis there are two categories given for this movement, being biogerontology (such as the work of interviewee Aubrey de Grey) and the second is the idea of body hacking. This distinction shows some similarities with the difference between cybernetics and bio hackers. As can be derived from the name, body hacking is in this case also the more DIY approach. Especially the activity of body hacking seems to show resemblance to what Giddens calls the regimes of the human body, of which even eating patterns are a part. However, this body hacking takes on a rather more extreme form.

#### **4.3.1 Biogerontology**

In the introduction of the interviewees it was explained that biogerontology is the biological approach to the study of aging. This study has multiple approaches and there is no mutual agreement on what would be best. Some for example believe in the study of telomeres to extend life, others, such as Aubrey de Grey, find salvation in trying to repair the damage that is done by aging. A scientist extremely interested in telomeres as the answer to aging, is professor of clinical medicine Michael Fossel. With a background in psychology he continued into the world of biogerontology and also founded the magazine *Journal of Anti-Aging Medicine*. Telomeres are the end pieces of the double stranded DNA molecules (chromosomes) in a cell. Whenever a cell divides,

---

<sup>8</sup> A device that could produce anything the user wanted

these telomeres become shorter. When they become too short the cell will no longer be able to divide, making it inactive, or it dies. It is this process that is generally linked to aging, but also to diseases such as cancer (Siegel, n.d., n.p.). Being able to control these telomeres, could mean an answer to mortality.

Gerontologist Aubrey de Grey does not see telomerase stimulation as a possible life extension therapy, since for example mice without genes for telomerase are “absolutely fine” (Best, 2006, n.p.). De Grey focuses on so called rejuvenation, this entails the repairing of damage that is done by the process of aging. This is also a different approach than slowing down the aging process, even though from the outside it might seem quite the same. In an interview with *The Life Extension Magazine* de Grey explains the following about this distinction: “Slowing aging requires a detailed understanding of the causes of aging. We are a long way from that kind of understanding, because aging is so complex. We can, however, easily identify the damage associated with aging. Fixing that damage results in rejuvenation.” (Best, 2006, n.p.). To reach this goal, as stated in the interviewee introduction, Aubrey de Grey has setup the SENS foundation. He has determined seven types of damages that are associated with aging, of which cancer is the most lethal one. Repairing the damage done by aging would eventually result in some form of indefinite lifespan. According to Fossil the work of Aubrey de Grey can be considered as replacing a hip instead of fixing the problem:

*You can think of the telomere as the conductor that sets the score for the orchestra. Rather than replacing the piano, you replace the score. One analogy I favor is to compare Mozart to the Grateful Dead. It is not just the instruments that distinguish them, it is the score they play. The difference between youth and old age is not just the genes, it is the pattern of gene expression. (Glaser, 2003, 295).*

In the light of transhumanism it is most striking that Aubrey de Grey does not truly sees himself as being a transhumanist, even though he is a much hailed speaker amongst this philosophy and many believe in the possibilities of his work. In the interview for this thesis he explained that it actually was the online presence of his work and predictions that made him a “darling of the transhumanist community” (de Grey Q3, 59).

#### **4.3.2 Body Hacking**

Since personal electronics have become more and more advanced, the concept of quantified self is making its advance. Quantified self (QS) entails the possibility of measuring one’s performances in order to enhance them. Body hacking is one of these QS activities, which focuses on (as the name might give away), the performance of the human body. Body hackers try to improve their body for example by rather extreme diets or sporting regimes. The differences between the approaches are

quite vast. Of course there is the difference between using sports or using diets to make changes, but next to this, some approaches focus more on an overall improvement of the body, while others might be more mind orientated. The borders of this type of transhumanism are a bit vague, since it might even be said that the way in which body builders, or in a lighter version the gym fanatics, approach their diet or vitamin regime, can also be considered body hacking. Overall this type of transhumanism is hard to distinguish, especially since there is so much activity that could be labeled as 'body hacking', but also because there seems to be some overlap with other transhumanists. Biogerontologist Michael Fossel, for example, also co-authored a book called *Immortality Edge*, that combines diet, lifestyle, exercise and for example meditation, with the aim of slowing down the aging process. Kevin Warwick also denoted this blurring of borders between possible other activities and transhumanism. He gave the example of eating meat or adding vitamin C to your diet to possibly enhance your IQ score (Warwick, Q12, 69).

There are several websites to be found on different types of body hacking. The Bulletproof Executive David Asprey for example searches the border between body hacking and biohacking. He has used several technological studies and tracking possibilities to come up with the ultimate diet (called the bullet proof diet). Asprey came from an IT background and truly calls his work 'hacking'. In the past 15 years Asprey has been able to enhance his body both esthetically as medically. For his work and accomplishments he has also been invited to speak at several transhumanist events. His ideas might be somewhat distanced from a cybernetics implant or especially from mind uploading, but it does show the possible other side of transhumanism.

An approach that might be somewhat more recognizable as being transhumanist is that of caloric restriction. A topic on which Aubrey de Grey has also written some thesis. Caloric restriction is based on the idea that lowering the intake of calories might prolong human life. This idea is based on the fact that in studies, mice live longer when food is short than when there is plenty of it. According to Aubrey de Grey this might only add 2-3 years (de Grey, 2005, 73), however in the interview for this thesis he also nuanced this by saying that modest postponements of aging should not be trivialized (Q13, 61).

A similarity between the two mentioned forms of transhumanist hackers (biohacking and body hacking) is that they might be a bit more egocentric. While a person such as David Asprey does share his findings, the activity itself is focussed on enhancing the hackers' own body, and not so much on improving the entire human race. It might however be questionable to what extent other transhumanists truly work for a greater good, or that they are merely seeking their own immortality. As Kevin Warwick also stated in the interview for this thesis, transhumanists are overall rather individualistic (Q10, 67).

#### **4.4 Chemical transhumanism**

This subchapter is relatively small compared to the other examples of transhumanist activities, because chemical transhumanism does not (yet) merit the same popularity as the other activities in the spectrum. Relatively little can be found on this subject and during this study it became somewhat apparent for the first time in the interview with George Overmeire. Overmeire described the book *The Hedonistic Imperative*, a book in which the author, David Pearce, describes the way in which feelings and emotions can be enhanced by taking drugs (Q17, 54). The main point in the book is that Pearce believes that with genetic intervention people can live in a happy state, devoid of pain and anxiety (Kent, 2009, n.p.). As Pearce himself states, when genetic intervention is successful, “[o]ur uglier Darwinian emotions can be abolished. Then we can lead lives truly worth remembering” (Pearce in Kent, 2009, n.p.). In the part about body hacking, body builders were also shortly discussed in relation to being considered transhumanists. For chemical transhumanism this is a similar case, it might be debatable to what extent for example the use of anabolic steroids is a form of chemical transhumanism.

In the interview with Kevin Warwick this chemical side of transhumanism also came up, when he discussed a conference he recently was invited to (Q11, 68). At this conference the main focus lay on the drug Modafinil, a drug that is normally used to treat the sleepiness caused by narcolepsy (a sleeping disorder), but believed to enhance cognitive capabilities when taken in a normal situation. The earlier mentioned bodyhacker David Asprey has also admitted taking these drugs and explained that taking these ‘smart drugs’ is part of his goal “to live longer, maximize my potential, and literally radiate energy” (Asprey, 2012, n.p.). Drugs have also been a popular subject in science fiction novels, for example the drug ‘Soma’ in *Brave New World*, or the ‘spice melange’ in *Dune*. However, the drugs in science fiction novels, such as ‘Soma’ are often not intended to do real good to its user, more often it is used to suppress people or simply described as one of the reasons for the decay of human society. This does of course not include all the examples of medical drugs that have been invented in fiction.

This chemical transhumanism is the hardest form of transhumanism to connect to Giddens’ theory of self identity and most importantly the role of the human body in this. It might be somewhat related to the regimes also mentioned with biological transhumanism. Overall it is another example of how control over the body can prevail.

#### **4.5 On the side of transhumanism**

Next to the definitive actions of transcending the human body, there are also some activities in which most transhumanists are involved. In this part the largest is discussed more elaborately, namely that of cryonics. Next to this the mind-body problem is addressed, since this is an important philosophical issue that rises with certain transhumanist activities and also for the idea of

identity formation and the transhumanist body. Even though these activities are not a direct part of transhumanism, they do offer an interesting account of the human body. The mind body problem, or more specifically disembodiment, has both come forth in the discussion of Giddens' theory and in the discussion of the different forms of transhumanism.

#### **4.5.1 (After)Life insurance**

As stated in the previous chapter, the idea of cryonics was first coined by American academic Robert Ettinger and stands for the idea that the human body can be frozen after death to be revived again in the future. This idea implies that the supporters hereof most likely do not believe in an afterlife. In his theory Ettinger fluctuates between the idea that the soul is detectable and the expectation that the soul is actually not important at all. His conclusion is that the soul is not the thing that will continue to exist after death, therefore he believes in returning in this life (Tandy & Stroud, 2002, 39). Unfortunately there are quite some uncertainties concerning cryonics. It is for example still not sure when the right time is to freeze a body and there is also no prospect on how long it will take science to reach the point at which it will be able to correctly unfreeze and revive it again. Despite all these uncertainties, a vast amount of transhumanists do espouse the idea and many even have a cryonics contract. Such a contract makes sure that once a person dies, the body is prepared and stored correctly. Therefore cryonics can be seen as the (after)life insurance of transhumanists; in case that science can not find an answer before the end of their lifespan, they have the possibility to be awoken when it does.

Both George Overmeire and Aubrey de Grey have such a cryonics contract and both have done so in order to not miss the possibility of an eternal life. Kevin Warwick had never thought about it, but is not reluctant to the idea. Overmeire explains that it is both the desire to immortality and a certain amount of curiosity to see what the future will look like (Q22, 56). Cryonics used to receive quite some resistance. At the seventh *Alcor Conference*, Aubrey de Grey gave a presentation called 'Is It Safe for a Biologist to Support Cryonics Publicly?'. In the interview for this thesis he explained: "[t]he public and professional resistance to cryonics is ultimately irrational - it's based on our deep-seated attachment to the idea that people need to be either alive or dead and not somewhere Schrodingeresquely unknown in between" (Q16, 62). He also explained that the acceptance is changing but still quite slowly. This is also shown by the fact that it is in some countries prohibited to keep bodies above ground, which according to George Overmeire is an outdated law (Q1, 44). This means that in such a country an undertaker must be found to properly prepare the body for cryonics, and ship it to the United States afterwards. Currently there are somewhat over hundred people cryo-preserved, with the first one already in that state for almost fifty years. This life insurance does come with a price tag, cryo-preserving an entire body costs 150.000 dollars, only preserving the brain costs a little more than halve (Javid, 2008, n.p.).

#### **4.5.2 The mind-body problem**

With some of the transhumanist ideas the philosophical question concerning the mind-body problem arises. This problem is not a recent one; already in early philosophy the ideas arose on the possibility of thinking without a body, also called the philosophy of mind, or dualism (of mind and body). Early examples can be found with the great thinkers Plato and Aristoteles, however the first clear elaboration came from Descartes. According to Descartes individual reason was the basis for awareness and the centre of knowledge (Ajana, 2005, n.p.). From his well known statement “*cogito ergo sum*”<sup>9</sup>, appears the strong distinction he made between body and mind. This mind-body dualism is therefore also known as the Cartesian dualism, and in this rationalism, sensory perception was seen as unreliable (Leezenberg & de Vries, 2001, 48). In general the enlightenment philosophers assumed that the rational self had an ‘inner’ relationship with the mind and an ‘outer’ relationship with the body. This ensured that the body was seen as part of nature and not as part of the individual self. Consequently the ultimate dream in cartesian dualism is disembodiment.

Therefore it could be said that mind uploading would be the ultimate dream for Descartes. The possibility of escaping the body would pave the way for entirely pure reason.

It is however not a fact that disembodiment is the universally accepted goal in philosophy. An opposite can be found in the form of monism. This approach can be divided into the more materialist ideas about the body alone being real, and the idealist ideas that state that reality is more or less mental (Proudfoot & Lacey, 2010, 254). From a monist perspective it is a lot easier to answer the question concerning the feasibility and desirability of disembodiment. For an idealist the question is entirely irrelevant since everything already exists only mentally. On the other hand for materialists, disembodiment is unthinkable because the lack of physical aspects would mean the end of being.

#### **4.6 The body in modern transhumanism**

The different forms of transhumanism that have been described in this chapter show the important and diverse role the body plays in this philosophy. Varying from the entire bypassing of the body by technology, to the adaption of regimes in order to influence the body’s capabilities. Where possible, each form of transhumanism was connected to certain parts of Giddens’ theory of self-identity. However, the biggest difference that becomes apparent with all these forms, is the fact that people today get to actively choose the boundaries of their body. This is an important change in the role of the body in the past two decades, but especially also for the formation of self-identity, which will be discussed more elaborately in the next chapter.

---

<sup>9</sup> I think therefore I am

## 5. Peripheral reflexivity

The previous chapter showed that there are quite some divergent forms of transhumanism today, each with their own relationship to the human body. One thing that remains undiscussed in this, is the influence these bodily modifications have on identity. Next to the original challenges which, according to Giddens, high modernity has posed, individuals are now exposed to an even greater amount of insecurities. No longer does one have to ask who he or she wants to be and which relationships to maintain, people are now confronted with decisions on removing certain bodily boundaries, with all its possible consequences. This chapter will go into this shift more detailed, and will offer an extension to Giddens' theory on self-identity, in the form of peripheral reflexivity, which will be explained more detailed by referring to several of the examples of modern transhumanism that have been described in this thesis.

### 5.1 Sociology of the body

The new role the body plays in modernity is not exactly uncharted territory. Throughout the last few decades, sociology of the body has become an important part of sociology. Sociology of the body focusses on the representation of the body and the influence society has on this development. This relationship is discussed, inter alia in more detail in the book *Body / Embodiment: Symbolic Interaction and the Sociology of the Body*. In the introduction by Dennis Waskul and Phillip Vannini it appears that the 1990's can be seen as a tipping point in this sociological development. They explain that this period is: "on the heels of significant social, cultural, political, and technological change, the body and experiences of embodiment appear substantially more visible than ever before – conditions that have stimulated sociological interests in a manner that is decidedly more direct, focused, and sustained compared to previous and legacy sociology" (2006, 1). Both the theory of Anthony Giddens as well as the beginning of true transhumanism, origins from this time, and as this study has shown, transhumanism has known vast changes and advances ever since.

As appeared in the chapter on Giddens, in his book on the reflexive self-identity, Giddens also devoted several pages to the changes in the human body and embodiment in modernity. In general, ideas on reflexivity are more commonly used for describing these changes, often referred to as reflexive embodiment. This reflexive embodiment stands for the capacity of individuals to perceive, reflect and act upon ones body (Crossley, 2006, 1). A well-known theory in this, is the looking glass self. A theory already coined by sociologist Charles Horton Cooley in the early 1900's. This theory is also referred to by Waskul and Vannini in their introduction, and stands for the fact that when an individual observes a body, he or she interprets what is seen, while similarly the person that is being observed imagines what the observer is seeing and feeling (Waskul & Vannini, 2006, 5). This means that the reflexivity of the body is caused by an expectation of others' observation. Mostly the work on this reflexive embodiment focusses on practices such as: 'mild' bodymodifications (like tattoos

and piercings) but also clothing, bodybuilding or, the perhaps expected, plastic surgery. With transhumanism, of course depending on which form, the possible acting part of reflexive embodiment moves beyond these examples. Especially with technological transhumanism it can go even as far as leaving the body itself behind.

## 5.2 A new reflexivity

This means that the theories on self identity and embodiment show some issues when it comes to transhumanism. Giddens does address the fact that the body becomes influenced by modernities reflexivity, but fails to address the real extend and consequences. The ideas on reflexive embodiment do address this in more detail, but they focus on the ‘mild’ forms of bodily adaption. Transhumanism goes far beyond this. It shows an entirely new way of dealing with embodiment. All forms of transhumanism have the same underlying goal in common: removing bodily boundaries. This has always been a primary focus, and the examples in the previous chapter show that this is still the case. This means that the acting part of reflexivity also takes on a more direct form. This can no longer be grasped under the ideas of Giddens or reflexive embodiment and therefore this thesis proposes the use of the term peripheral reflexivity. This stands for the fact that people today are actively engaged in the activity of observing, reflecting, and acting upon their bodily boundaries. It is no longer the question ‘how shall I live’, as proposed by Giddens, but the main question becomes ‘what do I want the borders of my body to be?’. Since identity and embodiment are so closely related, this also influences the construction of the self. This is caused by the fact that once an individual has chosen what borders he or she wants for her body, and acts upon it, this automatically involves the social dimension and the process of self-identity.

To explain how peripheral reflexivity works, the activity of cyborg transhumanism is taken as an example. This can be both cybernetics and body hacking. Lets presume that the first step is to observe. An individual will observe on a similar manner as was being discussed on the subject of the looking glass self. So by a combined observation and interpretation of others, together with a self consciousness on what others observe and interpret of them. However, transhumanist activities have a tendency to be somewhat individualistic, so it is not unthinkable that this looking glass self also takes on a bit more the shape of a one sided mirror. After this observation an individual will start asking questions on what he or she wants to have as bodily boundaries, deciding where the limits are. After deciding on this the individual will act on it. So in the case of cyborg transhumanism, the individual will most likely decide on the border being to maintain some form of human body, but aiding it by technology, be it in a do-it-yourself kind of style or by professionals. It might be hard to imagine how this might result or influence ones self-identity, however, when looking at the interviews, this also became apparent. While discussing the example of cryonics with George Overmeire it became clear how much influence this can have on

someones social surroundings. Where there used to be a group of people interested in transhumanism in general, there now appeared subgroups of likeminded people interested in, for example, cryonics. Another important social impact is the fact that not everyone around Overmeire had a similar interest, and sometimes this even resulted in incomprehension. This can also be seen in other transhumanist activities, and has a vast influence on ones identity formation. This influence might become more clear by looking at some possible future extremes. If an individual is able to choose whether he or she wants immense powers, or the ability to live twice as long or run four times faster than people in their social circles, this has major impacts. Differences between individuals increase, which will possibly lead to an increase in clustering and will induce great shifts in an individual's social dimension.

In some transhumanist examples the last step of peripheral reflexivity (acting) can not yet take place. This is for example the case in mind uploading. While the observation and reflection might result in an answer on the peripheral question that the limits are maintaining human agency through the mind, however in a disembodied setting, this is not yet possible. This does however not influence the power of peripheral reflexivity. The first steps might even be the most important and powerful in the process. Since determining that an individual feels at ease or even desires a disembodied state of being, is already an answer to the main question of the self and can already result in a specific form of identity, since these individuals will start acting like it, in perhaps less direct manners. This can be for example involvement in certain groups and working in certain environments.

## 6. Conclusion

This thesis has studied the transhumanist philosophy, to better understand the relationship between the body and identity in this late modern society. This was done with the theoretical perspective on self-identity from Anthony Giddens. This part will offer a retrospect of the most important points and will answer the main question of this study: how can the modern (transhumanist) body be fitted in Giddens' theory of reflexive self-identity.

### 6.1 Reflexivity and transhumanism

To answer the main question in this study, two different methodological approaches from the qualitative forms of analyses have been chosen: that of a (critical) literature analysis and the semi-structured expert interview. The advantages and disadvantages of these approaches have been discussed more elaborately in the first chapter. This included the biases in literature and interviewee selection, possible influence of the interviewer and the crisis of representation and legitimation. Where possible this study has of course tried to avoid them, but it is important to keep these in mind when discussing the conclusion of the study.

The Subquestion of this research, what transhumanism today entails, was meant to better understand the role of the human body in high modernity. It appears that transhumanism has become a complex concept. When Julian Huxley first wrote about it, he envisioned a new form of enlightenment, ensuring a social and psychological enhancement of human beings. Max More thought of it, around 1990, as being the acceleration of the evolution of human beings beyond their current form, caused by science and technology. From the interviews that were conducted for this study it appeared that much has changed since the arrival of this philosophy. Therefore this study has sought for the modern form of transhumanism, to see what role the body played in this. The different forms of transhumanism appeared to be part of a spectrum ranging from the more technological to the more biological and even chemical approaches. The more technological side of the spectrum showed little interest in embodiment, giving examples of mind uploading and singularity. With cyborg transhumanism the aim was to maintain an embodied form, however to aid it with technology to remove certain boundaries. With the biological and chemical approach it is clear that respectively biological or chemical aids were used to lift the borders, while keeping the human body intact.

This thesis has also given a detailed (critical) literature analysis of Giddens' theory on reflexive self-identity and its critics. Giddens' theory is that our current society is a form of high modernity, characterized by being post-traditional and reflexive. Since certain steady pillars are missing in society, individuals have to reflexively create their identity. This reflexivity stands for the fact that the individual is now forced to ask questions on who they want to be and which relationships they want to maintain, or in other words: 'how shall I live?'. Critics on Giddens blame him for lacking a

social and moral dimension and also for the fact that he has no empirical proof. Giddens also wrote about the human body in this post-traditional society, explaining that the body itself is also subject to many changes and plays a more important role in identity formation. Control over the human body plays an important role in maintaining the biography of self-identity. The criticisms on these ideas on the role of the body in self-identity, are fairly similar to those mentioned above. It lacks moral, it is not proven that this only accounts for high modernity and finally the issue is raised that Giddens ignores the agency of the body in self identity, seeing it too much as two separate entities.

So with the arrival of a modern, more profound, form of transhumanism, another issue with the theory on reflexive self-identity becomes clear. The theory focusses on the fact that identity is no longer a fixed thing, but it has become a fluid reflexive process. However, whereas the body in Giddens' theory does play an important 'secondary' role, this thesis shows that today the body becomes much more than a mere consequence of the post-traditional high modernity. He does address the fact that we are now able to change more about the body, however, according to Giddens, this is part of the larger question of 'how shall I live?'. Today the body is no longer a part of the reflexive self-identity question, it has become a question on itself, induced by the influences of high modernity and developments in transhumanism.

Even the ideas on reflexive embodiment, which focus more on the acting out after observing and reflecting on the body, are not sufficient since they focussed on 'minor' bodily modifications, which did not have the possible severe consequences, such as disembodiment. Therefore this study introduces the concept of peripheral reflexivity. A form of reflexivity focussing solely on the question of the borders of the human body. The primary question is 'what do I want the borders of my body to be?', which after observation, reflecting and acting not only results in a change in the borders of embodiment, it also influences the formation of self-identity due to the changing social dimension it induces. This might perhaps not seem as a highly relevant concept right now, since not so many people are involved in modern transhumanist activities. However, if everything goes according to transhumanist plans, within fifty to hundred years this question will be 'do I want to be immortal', with all its sociological consequences.

## **6.2 Discussion**

The main thing that is left open after this study, is the true extend of peripheral reflexivity, and especially the relation with identity formation. A study into this will primarily be a sociological question, which would entail looking at the identity formation of individuals in certain transhumanist groups. This would offer an interesting perspective on the relationship between the body, identity and the social dimension. Another important question that remains unanswered, is the question what happens to identity when the final stage of disembodiment is reached, as might be the possible future with, for example, mind uploading. One can only speculate on what type of

anxiety this will result in, or whether it even results in an anxiety. It is said that embodiment plays an important role in identity, therefore it is important to address the effects of disembodiment in further studies on peripheral reflexivity. However, the question on what the effects hereof are on identity are possibly a more philosophical question than a sociological one, since the mind-body problem will pose the question of whether there will still be a 'self' in disembodiment. Would someone still be the same person, if their mind is separated from their body and uploaded onto a computer?

## 7. Bibliography

### 7.1 Publications

Adams, M. (2003). The reflexive self and culture: a critique. *British Journal of Sociology* 54(2), 221-238.

Adams, M. (2004). Whatever Will Be Wille Be: Trust, Fate and the Reflexive Self. *Culture Psychology* 10(4), 387-408.

Ajana, B. 2005. Disembodiment and cyberspace: A phenomenological Approach. *Electronic Journal of Sociology* 7: n.p.

Anonym, L. (2010). FAQ. *Sapiens Anonym*. Retrieved on September 20, via: <http://sapiensanonym.blogspot.nl/search/label/faq>.

Anonymous. (n.d.). Aubrey de Grey. *SENS Foundation*. Retrieved on December 22, via: <http://www.sens.org/users/aubrey-de-grey>.

Anonymous. (n.d.). The next step towards true Cyborgs?. *Professor Kevin Warwick*. Retrieved on December 12, via: <http://www.kevinwarwick.com/Cyborg2.htm>.

Anonymous. (n.d.). Kevin Warwick - Home Page. *Professor Kevin Warwick*. Retrieved on December 12, via: <http://www.kevinwarwick.com/index.asp>.

Asprey, D. (2012). How to buy Modafinil (Provigil) - and Q&A. *The Bulletproof Executive*. Retrieved on January 18, via: <http://www.bulletproofexec.com/>.

Association for Gerontology in Higher Education. (n.d.). What is Gerontology? Geriatrics?. Association for Gerontology in Higher Education. Visited on December 23, via: <http://www.careersinaging.com/careersinaging/what.html>.

Atkinson, W. (2007). Anthony Giddens as Adversary of Class Analysis. *Sociology* 41(3), 533-549.

Best, B. (2006). Aubrey de Grey, PHD an Exclusive Interview with the Renowned Biogerontologist. *Life Extension Magazine*. Retrieved on December 15, via: [http://www.lef.org/magazine/mag2006/feb2006\\_profile\\_01.htm](http://www.lef.org/magazine/mag2006/feb2006_profile_01.htm).

Bisson, T. (1991). They're Made Out of Meat. *Omni* 13(7), 54.

- Bostrom, N. (2005). A History of Transhumanist Thought. *Journal of Evolution and Technology* 14 (1), 1-25.
- Buckingham, D. (2008). Introducing Identity. *Youth Identity and Digital Media*, Buckingham, D. (ed.). Cambridge: MIT Press, 1-24.
- Budgeon, S. (2003). Identity as an Embodied Event. *Body Society* 9(1), 35-55.
- Burkitt, I. (1999). *Bodies of Thought: Embodiment, Identity and Modernity*. London: Sage Publications Ltd.
- Crossley, N. (2006). *Reflexive Embodiment in Contemporary Society*. Maidenhead: Open University Press.
- Crossley, N. (2006). The Networked Body and the Question of Reflexivity. *Body / Embodiment: Symbolic Interaction and the Sociology of the Body*. Waskul, D. & Vannini, P. (eds.). Aldershot: Ashgate Publishing Limited, 21-34.
- Flick, U. (2009). *An Introduction to Qualitative Research*. London: Sage Publications.
- Foucault, M. (2008). *Power/Knowledge: Selected Interviews and Other Writings 1972-1977*, Gordon, C. (ed.). New York: Pantheon Books.
- Freund, P.E.S. (1988). Bringing Society into the Body: Understanding Socialized Human Nature. *Theory and Society* 17(6), 839-864.
- Gauntlett, D. (2008). *Media, Gender and Identity*. New York: Routledge.
- Gelles, D. (2008). Immortality 2.0: A Silicon Valley Insider Looks at California's Transhumanist Movement. *The Futurist* 43(1), 34-41.
- Gibson, W. J. & Brown, A. (2009). *Working with Qualitative Data*. London: Sage Publications Ltd.
- Giddens, A. (1990). *The Consequences of Modernity*. Stanford: Stanford University Press.

Giddens, A. (1991). *Modernity and Self-Identity: Self and Society in the late Modern Age*. Stanford: Stanford University Press.

Giddens, A. (1993). *New Rules of Sociological Method*, Second Edition. Stanford: Stanford University Press.

Glaser, V. (2003). Pieces of the Puzzle: An Interview with Michael Flosser, M.D., Ph.D... *Journal of Anti-Aging Medicine* 6(4), 293-297.

Goffman, E. (1959). *The Presentation of Self in Everyday Life*. New York: Doubleday.

Goldstein, E. R. (2012). The Strange Neuroscience of Immortality. *The Chronicle*. Retrieved on November 10, via: <http://chronicle.com/article/The-Strange-Neuroscience-of/132819/>.

Gray, P. S., Williamson, J. B., Karp, D. A. & Dalphin, J. R. (2007). *The Research Imagination*. Cambridge: Cambridge University Press.

Grey, de. A. (2005). The Unfortunate Influence of the Weather on the Rate of Ageing: Why Human Caloric Restriction or Its Emulation May Only Extend Life Expectancy by 2–3 Years. *Gerontology* 51(2), 73-82.

Hammersley, M. & Atkinson, P. (2007). *Ethnography: Principles in Practice*. New York: Routledge.

Hughes, J. J. (2012). The Politics of Transhumanism and the Techno-Millennial Imagination, 1626-2030. *Zygon* 47(4), 757-776.

Humanity+. (n.d.). Mission. *Humanity+*. Retrieved on January 20, via: <http://humanityplus.org/about/mission/>.

Humanity+. (2008). Report on the 2007 Interests and Beliefs Survey of the Members of the World Transhumanist Association. *Humanity+*. Retrieved on December 4, via <http://transhumanism.org/resources/WTASurvey2007.pdf>.

Huxley, J. (1957). *New Bottles for New Wine*. London : Chatto and Windus.

- IMM. (n.d.). Molecular Manufacturing. Institute for Molecular Manufacturing. Retrieved on December 10, via: <http://www.imm.org/>.
- Javid, F. (2008). Cryonics: Staying Alive a Little Longer. ABC News. Retrieved on November 20, via: <http://abcnews.go.com/Health/Longevity/story?id=4520397&page=1#.UObVvYnjLRJ>.
- Kent, J. (2009). The Genomic Bodhisattva. *H+ Magazine*. Retrieved on January 19, via: <http://hplusmagazine.com/2009/09/16/genomic-bodhisattva/>.
- Koene, R. A. (2012). Mind transfer: human brains in different materials. *Engineering Evil*. Retrieved on December 20, via: <http://engineeringevil.com/2012/11/02/could-we-copy-a-specific-brain-or-transfer-our-minds-to-another-device-research-suggests-this-amazing-idea-might-be-feasible/>.
- Leezenberg, M. & Vries, de, G. (2001). *Wetenschapsfilosofie voor geesteswetenschappen*. Amsterdam. Amsterdam: University Press.
- Loukides, M. (2012). Biohacking: The next great wave of innovation. *O'reilly Radar*. Retrieved on November 10, via: <http://radar.oreilly.com/2012/10/biohacking.html>.
- More, M. (1990). Philosophy. *Humanity+*. Retrieved on November 20, via: <http://humanityplus.org/philosophy/philosophy-2/>.
- More, M. (1995). The Extropian Principles V.2.6. *Max More*. Retrieved on November 20, via: <http://www.maxmore.com/extprn26.htm>.
- Mul, J. de. (2002). Transhumanisme. *Filosofie in Cyberspace*, Mul, J. (ed.), Kampen: Uitgeverij Klement, 329 - 351.
- Prisco, G. (2012). Becoming cyber angels. *Turing Church*. Retrieved on December 15, via: <http://turingchurch.com/2012/05/05/becoming-cyber-angels/>.
- Prisco, G. (2012). Uploaded Minds to the Stars. *Turing Church*. Retrieved on January 20, via: <http://turingchurch.com/2012/12/16/uploaded-minds-to-the-stars/>.
- Proudfoot, M. & Lacey, A. A. R. (2010). *The Routledge Dictionary of Philosophy*. New York: Routledge.

Siegel, L. J. (n.d.). Are Telomeres the Key to Aging and Cancer?. Learn Genetics. Retrieved on December 20, via: <http://learn.genetics.utah.edu/content/begin/traits/telomeres/>.

Singularity Institute. (n.d.). What is the Singularity?. *The Singularity Institute*. Visited on November 2, via: <http://singularity.org/what-is-the-singularity/?gclid=CLW42bbJq7QCFYlb3godsjcAMw>.

Szerszynski, B. (1996). On Knowing What to Do: Environmentalism and the Modern Problematic. *Risk, Environment & Modernity*, Lash, S., Szerszynski, B. & Wynne, B. (eds.). London: Sage Publications Ltd, 104-137.

Tandy, C. & Stroud, S. R. (2002). *The Philosophy of Robert Ettinger*. Boca Raton: Universal Publishers.

Tomas, D. (1995). Feedback and Cybernetics: Reimagining the Body in the Age of Cybernetics. In: Featherstone, M. & Burrows, R. (eds.) *Cyberspace, Cyberbodies, Cyberpunk*. London: Sage Publications, 21-44.

Wiener, N. (1961). *Cybernetics: or Control and Communication in the Animal and Machine*. Cambridge: MIT Press.

Wikipedia. (n.d.). Giulio Prisco. Wikipedia: The Free Encyclopedia. Retrieved on December 12, via: [http://en.wikipedia.org/wiki/Giulio\\_Prisco](http://en.wikipedia.org/wiki/Giulio_Prisco).

Walsham, G. (1998). IT and Changing Professional Identity: Micro-Studies and Macro-Theory. *Journal of the American Society for Information Science* 49(12), 1081-1089.

Waskul, D.D. & Vannini, P. (2006). Introduction: The Body in Symbolic Interaction. *Body / Embodiment: Symbolic Interaction and the Sociology of the Body*. Waskul, D. & Vannini, P. (eds.). Aldershot: Ashgate Publishing Limited, 1-18.

Yiu, C. (2012). *The Big Data Opportunity: Making government faster, smarter and more personal*. London: Policy exchange.

Zhao, K. & Biesta, G. (2012). The Moral Dimension of Lifelong Learning: Giddens, Taylor, and the “Reflexive Project of the Self”. *Adult Education Quarterly* 62(4), 332-350.

## 6.2 Multimedia

Verge (2012). Biohackers: A journey into cyborg America. *The Verge*. 13:32. Retrieved on November 2, via: <http://www.theverge.com/2012/8/8/3177438/cyborg-america-biohackers-grinders-body-hackers>.

Infomania (2008). Cyborg Life. *Infomania*. 7:48. Retrieve on December 10, via: [http://www.youtube.com/watch?v=RB\\_l7SY\\_ngI](http://www.youtube.com/watch?v=RB_l7SY_ngI).

Seung (2010). I am my connectome. *TED*. 22:35. Retrieved on December 20, via: <http://www.youtube.com/watch?v=HA7GwKXfjB0>.

Warwick (2012). Implants & Technology -- The Future of Healthcare?. *TED*. 21:16. Retrieved on December 3, via: <http://www.youtube.com/watch?v=Z8HeFNJjuj0>.

## 8. Appendix

### 8.1 Interview George Overmeire

*1. Hoe ben jij in aanraking gekomen met het transhumanisme? Had je de ideeën al, maar was de term je nog onbekend of ging je je er juist in verdiepen doordat je er van hoorde?*

Transhumanisme vind ik zelf eigenlijk niet meer zo bijzonder en dat is misschien wel een van de redenen waarom het in Nederland niet meer zo actief is. Het is wel enigszins mainstream aan het worden. Toen ik met het begrip transhumanisme in contact kwam, want je komt er achter dat je deze dingen altijd al wel denkt, maar mijn omgeving verklaarde mij voor gek, en dan kom je er achter dat er in Nederland zo'n 10 gelijkgestemden rondlopen ongeveer en dat daar een begrip aan hangt, transhumanisme wat op een gegeven moment door iemand bedacht is dan ga je wat meer over die dingen praten een soort coming out bijna. Dan verklaart iedereen je nog voor gek, maar tegenwoordig zijn veel van die dingen werkelijkheid geworden. Bijvoorbeeld therapeutisch klonen, gen-technologie waarvan 10 jaar geleden iedereen dat nog science fiction vond, op een gegeven moment wordt het dan gedaan en zover het nog niet kan is het inmiddels bij iedereen wel duidelijk dat het in de zeer binnenkort wel zou kunnen. Er zijn maar een paar onderwerpen binnen het transhumanisme overgebleven die zo futuristisch lijken dat iedereen denkt dat het science fiction is. Dus men gaat het inmiddels wel zien. Ik zie transhumanisten meer als mensen die een wat meer geïnformeerde mening hebben over de toekomst dan de gemiddelde Nederlander en daarnaast denk ik dat het niet zo heel bijzonder is.

Toen het Internet opkwam ben ik er meteen ingestapt, toen het nog via de telefoonlijn ging. Toen kwam ik al vrij snel in contact met de Amerikaanse vorm van het transhumanisme, dat trouwens extropianism heet. Dat vind ik ook wel iets interessanter dan de Nederlandse vorm, dus ik werd ook lid van de mailing list en ging allemaal lezen wat die lui te zeggen hadden, dat sprak me gelijk enorm aan. En toen op een gegeven moment kwam ik er dan achter dat er ook een Nederlandse groep was, Transcedo heet die groep of althans heette want het is nu natuurlijk alleen maar een domeinnaam. Die hadden de Nederlandse groep opgericht ik ging op die website kijken en dacht nee daar ga ik geen lid van worden. Sowieso ben ik niet echt een verenigingsmens, dat zijn transhumanisten in het algemeen niet zo, het zijn vrij individualistisch soort mensen denk ik. Het verenigingsgebeuren zat niet echt in ons. Maar op een gegeven moment werd ik rechtstreeks aangeschreven door een van de oprichters van Transcedo, Henry Kluytmans, en die zei 'ik zie dat je ook ingeschreven staat op die mailing lijst van extropy zou je niet eens willen komen dan vooral omdat we mensen nodig hebben voor het cryonisme. Dus we willen wel graag proberen om wat massa te maken'. Dus toen ben ik er bij gekomen, dat betekende eigenlijk dat we een keer per

maand bij elkaar kwamen in de stationsrestauratie in Utrecht, want dat lag centraal en dan gingen we daar met elkaar praten. Maar je bent op een gegeven moment ook wel uitgepraat, want je bent het met elkaar eens min of meer. Wat details waarin je van mening verschilt, die lagen vooral op politiek vlak overigens. Ik ben meer op de Amerikaanse vorm ben ingesteld is omdat het wat libertarischer is in het politieke spectrum. In die tijd, dat ontkennen ze tegenwoordig wel erg, maar in ieder geval is die erg beïnvloed door de filosofie van Ayn Rand. Het Europees transhumanisme en ook het Nederlandse is meer naar de socialistische kant. Ik zal niet zeggen dat ze echt socialistisch zijn, maar ze hebben wel echt een sociale component daarin. Dat betekent dat wij ons heel erg opstellen, of althans de Europeanen, of de politiek het er mee eens is. Bijvoorbeeld zoets als cryonisme dat is een hachelijke strijd, want in Nederland is cryonisme niet toegestaan, in die zin dat het niet toegestaan is om overleden lichamen boven de grond te bewaren of ze ingevroren zijn of niet. Dat is een wet die dateert uit 1948 en dat zal ongetwijfeld in 1948 een heel bruikbare wet geweest zijn, maar die wet bestaat nog steeds. Nou maken Europese cryonisten zich erg kwaad, dat het in geen enkel Europees land mag, je kan ook gelijk denken is het niet anders mogelijk, kunnen we niet om die politiek heen? Aangezien we in Nederland met z'n zevenen zijn, of althans zeven mensen die zich actief willen laten invriezen is dat niet voldoende om de wet te gaan veranderen, dat doen ze gewoon niet. Dus je kunt je kwaad maken, je kunt een protestmars organiseren, maar ik vind dat bijvoorbeeld een verspilling van energie en dat vinden dus inmiddels de meeste mensen die op mijn lijn staan. Dat is misschien wel de belangrijkste reden dat het transhumanisme in Europa een beetje ten grond gaat aan het luchtfietserij gebeuren. Ja, praten over de zaak zou moeten zijn de zaak aanpakken, een aantal dingen doen die we wel kunnen doen.

*2. Je zei ook dat je de Amerikaanse tak, Extropy, interessanter vindt, komt dat vooral door de politieke achtergrond?*

Ja dat is wel één van de dingen, ik beschouw politiek als iets dat er is en je zal er dus mee moeten dealen. Ik ga niet anarchistisch roepen dat de politiek omver geworpen moet worden, maar ik beschouw het wel iets als dingen waarin je moet leren navigeren. We hebben politiek nou eenmaal en die maken wetten en je kunt het wel of niet met die wetten eens zijn maar je zal moeten proberen om dat spel eromheen te spelen. Om nou echt je kwaad te gaan maken op die politiek, om de politiek te veranderen, dat lukt je niet omdat we daarvoor gewoon met te weinig zijn. En temeer daar ik denk dat vroeg of laat een aantal dingen toch wel gebeuren. Dingen waar transhumanisten bijvoorbeeld ook in geïnteresseerd zijn, is bijvoorbeeld de kolonisatie van de ruimte, dat is ook een aspect wat bij veel transhumanisten leeft. Het zal duidelijk zijn dat men daar natuurlijk zeker in Europa maar ook in Amerika, nooit aan gaat beginnen. Dat is natuurlijk van de politiek afhankelijk vanwege het geld. Er zijn opgestart projecten opgestart, onder andere via het

Google x project, maar je hebt ook die Peter Diamandis die inmiddels een project heeft opgestart om asteroïden te ontginnen. Projecten die allemaal al zeker 20, 30 jaar lang in de pen zijn en beschreven zijn en maar wachten en wachten tot de politiek een beslissing neemt, maar die doen dat niet. Politici zitten er altijd maar een jaar of vier, maximaal acht in Amerika, en dan moeten ze gewoon een punt gemaakt hebben. Kolonisatie is natuurlijk te veel een lange termijn verhaal, behalve Amerika met de maanlanding, dat heb ik nog als kind meegemaakt, dat was natuurlijk in de koude oorlog en dat was om de Russen te verslaan en dan doen Amerikanen het wel en dan kan het natuurlijk ook gewoon. Dus dat zijn eigenlijk een beetje de belangrijke dingen waardoor het mis gaat, maar aan de andere kant merk je dat er in Nederland veel transhumanisten rondlopen, alleen ze zijn niet georganiseerd of ze brengen het niet heel erg naar buiten, maar als je berichten van mensen op een mailing list of Facebook doorleest, zal je merken dat transhumanisme met of zonder het woord, algemeen leeft in Nederland.

*3. Dat is best opmerkelijk, gezien wanneer ik dit onderwerp bespreek met mensen in mijn omgeving, ik merk dat er veel onbegrip en over het algemeen genomen geen kennis is over deze filosofie. Zelfs kennis over alle technologische aspecten die al mogelijk zijn. Het lijkt alsof mensen het over het algemeen wel eens zijn met de achterliggende gedachten maar dat ze niet weten in hoeverre het al speelt.*

Sterker nog je kan dat denk ik zelfs zien bij de oprichter van het Rathenau instituut, een soort denktank die is opgericht onder andere om de Nederlandse regering te leiden en te adviseren bij de vernieuwingen die er zijn dus nanotechnologie en alles wat binnen het transhumanisme al lange tijd optimistische gespreksonderwerpen zijn. Dan komt er zo'n moment waarop iemand in de politiek zich er van bewust wordt dat nanotechnologie een opkomend iets is, en dan gaan ze denken daar moeten we wat mee. Nou heeft doorgaans zo'n politicus daar te weinig zicht op dus dan wordt er een denktank opgericht en dat is het Rathenau instituut. Een relatief conservatieve instelling en het fanatisme alleen al waarmee die mensen proberen een aantal dingen te bestrijden, geeft aan dat er zaken aan de gang zijn. Het is natuurlijk alleen nodig het te bestrijden als het in opkomst is. Nanotechnologie bestaat als woord in feite al, zoals het wordt toegepast in de industrie, dat is trouwens technologie op moleculaire schaal. Waar transhumanisten op mikken, wanneer ze het over nanotechnologie hebben, en daarom gebruiken we tegenwoordig liever de term moleculaire nanotechnologie, dan dat is eigenlijk omdat het ook kan gaan dat je op die moleculaire schaal computertjes kunt programmeren, nanobots als het ware, die zichzelf kunnen repliceren, vermenigvuldigen. En dat heeft natuurlijk ongelooflijke consequenties onder andere voor ruimte kolonisatie maar ook in de geneeskunde bijvoorbeeld. Het grappige is dat de science fiction schrijver Isaac Asimov dat, ik geloof in de zestiger jaren, al beschreven heeft in *The Fantastic Voyage* of in het Nederlands *Reisdoel Menselijke Brein*. Dat als het ware gewoon kleine robotjes in jouw

lichaam gaan om daar even een tumor of een goedaardig gezwel of een bloedprop in de hersenen om dat ter plekke te kunnen vernietigen van binnen uit. Eigenlijk op dezelfde manier als dat we nu medicijnen in je lichaam sturen zou je dan robotjes er in kunnen sturen die dan daar hun werk doen, goed geprogrammeerd zijn zich vermenigvuldigen tot het aantal dat nodig is en daarna natuurlijk zichzelf ook weer oplossen. Dat is op dit moment nog wel redelijk toekomstmuziek alhoewel men ook daar al ver mee is.

#### *4. De ontwikkelingen zijn er zeker*

Ja, en het is nu eigenlijk zo dat als ik dit verhaal een jaar of 12 13 geleden vertelde iedereen me uitlachte, maar nu heeft bijvoorbeeld het Labyrinth anderhalf jaar gelden op de televisie aandacht besteed aan dit principe, van die robotjes, dat onder andere door Philippe van Nederveelde in Europa en Robert Freitas in Amerika heel erg gepromoot wordt en Labyrinth besteedde daar behoorlijk grote aandacht aan, met een enorm mooie film waarin ze precies lieten zien hoe dat werkt. En dat geeft dus alleen al aan dat het dichtbij is.

#### *5. Je bent heel actief geweest op verschillende platformen omtrent het transhumanisme en cryonics in Nederland, vind je dat het transhumanisme een echte Nederlandse tak heeft gekend?*

We hebben die groep gehad, dat was een beetje een praatgroep, maar wat eigenlijk bijna iedereen voornamelijk wilde was een invriescontract. Dat is eigenlijk het eerste wat je kan doen als je het over de toekomst hebt en daar naar uitkijkt dan wil je er ook deel van uitmaken. Nou ja ik ben 54 en tien jaar geleden dus 44, maar het idee is dat de doorbraak dat moleculaire nanotechnologie uitgevonden wordt, en geïmplementeerd, dat zou op z'n vroegst ongeveer nog 50 jaar duren, vanaf die tien jaar geleden. Dus in mijn geval, en ik kan natuurlijk geluk hebben, maar is het realistisch om te denken dat ga ik niet halen, ik ga dood voor die tijd. Dan is een invriescontract natuurlijk wenselijk omdat dat, als je natuurlijk goed ingevroren wordt en als dat cryogene suspensie werkt, als het een haalbaar iets is, dan zou het kunnen betekenen dat ze me in de toekomst kunnen ontvriezen. Daar heb je moleculaire nanotechnologie voor nodig. Dus invriezen is het eerste wat we willen want je kan oneindig praten over nanotechnologie en ruimte kolonisatie, maar als je er geen onderdeel van mag uitmaken omdat het nog te ver weg is, dan is dat jammer. Invriezen is het beste wat je nu kan doen. Op dat moment zat het een beetje tegen en leek het er naar uit te zien dat het niet mogelijk was om vanuit Nederland een suspensie contract te realiseren. Daar ben ik toen zelf een keer voor naar Engeland gegaan, daar hebben ze een vrij grote groep cryonisten en daar heb ik met een aantal mensen gepraat en toen ik dat weekend terugkwam toen wist ik het zeker, dit ga ik

ook regelen. Het heeft mij ongeveer anderhalf jaar gekost en toen heb ik het voor elkaar gekregen dat het in Nederland mogelijk was om je in ieder geval in Nederland alvast te laten voorbereiden en je dan naar Amerika te vervoeren om je daar te laten invriezen, de opslag dus eigenlijk te regelen en dat mag in Amerika, niet in Europa. Het vreemde was eigenlijk dat toen dat eenmaal mogelijk was het groepje een beetje uit elkaar viel. Vandaar dat de groep die nu nog daarvan over is, dat zijn mensen die zich echt willen laten invriezen en ook een contract hebben, en de overige groep die bemoeit zich er eigenlijk niet meer mee. Terwijl daar mensen bij zitten die eerst heel fanatiek riepen dat ze zich ook wilden laten invriezen. Dat ze het echt verbijsterend vonden en slecht vonden dat dat in Nederland niet kon, maar het blijkt achteraf dat dat wel kan. Je moet een aantal dingen regelen, een notaris, een speciaal contract regelen, dat moest opgesteld worden want het was er nog niet, dus dat moet je even uitpluizen met de juiste mensen. Je moet een keer een gesprek aan gaan, maar het heeft me anderhalf jaar gekost maar het was niet onmogelijk. Het was alleen lastig, het was niet onmogelijk want het is uiteindelijk gelukt. Nu ligt er een sjabloon, dus iedereen die zich wil laten invriezen die kan gewoon dat sjabloon overnemen en dat aanpassen aan zijn eigen financiële situatie. Het is heel goed te doen, het is niet extreem duur of wat dan ook, dus het is eigenlijk heel makkelijk. Het vreemde dan is natuurlijk dat daardoor vreemd genoeg lijkt het wel alsof een deeldoel gerealiseerd is, daarna alle gespreksonderwerpen wegvallen. We hebben dus nog wel van die groep de cryonisten over die wel een contract hebben, we zijn dacht ik met z'n zevenen, zo uit het hoofd gezegd. En de rest daar horen we niet meer over, we hadden natuurlijk toen nog een mailing list, dat was de gebruikelijke manier van communiceren, en die mailing list via Yahoo Groups die bestaat officieel nog steeds maar die is zo dood als een pier, daar reageert niemand meer op. Want op een gegeven moment gingen mensen zeggen "ja er wordt wel heel veel over cryonics gepraat, er zijn toch ook wel andere onderwerpen?". Dus toen hebben we met de cryonisten besloten een tweede mailing list op te zetten en dat we alle post over cryogene suspensie via die mailing list zouden doen. Nou toen bleek dat er verder geen onderwerpen meer over waren voor de anderen want mijn behoefte om over de kolonisatie van de ruimte te praten stopte ik eigenlijk in mijn werkt dat ik voor de marsociety deed in die tijd en alle andere dingen ja je komt steeds op andere vormen. Internationaal bijvoorbeeld en via Facebook inmiddels, dat is de laatste 3 a 4 jaar sterker geworden. Dan kun je toch al met al die mensen praten, ik hoef niet perse naar Utrecht toe om de mensen te ontmoeten, je komt toch wel aan je informatie.

*6. De eerste transhumanisten bijeenkomst (transvision) vond wel plaats in 1998 in Nederland, was dat met een bijzondere reden?*

Ik moet nageven ik was er toen net bij, ik ben er wel bij geweest bij Transvision, in Weesp was dat, maar ik heb het dus niet georganiseerd, dat hebben andere mensen gedaan, Henry Kluytmans,

Berrie Staring Dali Potter Arjen Kamphuis. Die hebben de eerste versie georganiseerd, het was in een hotel in Weesp en daar waren een aantal andere Europese mensen bij, die inmiddels allemaal vrij bekend zijn geworden en daarna is besloten het ieder jaar ergens anders te doen.

*7. Toch opvallend dat het dan door een aantal Nederlanders georganiseerd was*

Ja dat was een goeie zet, dat heeft dus een aantal opvolgers gehad, maar uiteindelijk is toch ook dat weer doodgebloed. Zelfs in heel Europa is dat te klein. Frankrijk heeft eigenlijk nauwelijks transhumanisten, ik ken er 1, dat komt doordat Frankrijk niet zo'n heel vriendelijk land is voor dit soort activiteiten. Duitsland heeft wel een grote groep, nou is dat natuurlijk ook een groot land. Duitsland heeft transvision ook een keer georganiseerd, in 2001 in Berlijn, maar die hadden elkaar daar ook nog nooit gezien. Die hebben alles via de mail geregeld en de taken verdeeld en die kwamen net als ik elkaar pas tegen tijdens het transvision congres. Zo verspreid is het daar, maar ze hebben wel een actieve groep, ze hebben ook nog een website die geregeld geüpdate wordt. Het jaar daarvoor was het georganiseerd in Engeland door Nick Bostrom, maar die is inmiddels ook helemaal actief geworden in allerlei andere organisaties en is ook hoogleraar geworden dus die heeft het druk genoeg met onderzoek.

*8. Merk je verschil tussen transhumanisten uit verschillende landen binnen Europa?*

Het gaat eigenlijk iets meer over, voor mijn gevoel dan, technologische ontwikkelingen die gedaan worden, nieuwe onderzoeken die gedaan worden. En zoals ik al zei het is redelijk mainstream het is eigenlijk vooral mensen met een visie op de toekomst, het echt transhumanisten dat bijvoorbeeld gaat over mind uploading en singularity dat blijft toch nog wel beperkt, ook hier weer tot de meer internationale dingen. De Amerikanen zijn daar wat meer mee bezig, twee Nederlanders die zich in Nederland wel echt bezig houden met transhumanisme zijn Amanda Stoel, zij heeft de Facebook groep opgericht en is daar ook heel actief met posten. Zijn wel voornamelijk dingen die te maken hebben met technologische vorderingen die nu aan de gang zijn, een soort nieuws aggregatie die het is, dat is natuurlijk belangrijk genoeg want iedere stap die nu gezet wordt, die reëel is, die leidt mensen ook tot het verder denken wat er in de toekomst nog meer mogelijk zou kunnen zijn. Dan heb je nog iemand waarvan ik niet weet hoe hij er uitziet, Khannea Suntzu, dat is iemand die vooral geïnteresseerd is in virtualiteit, hij is heel actief met Second Life. Er zijn binnen het transhumanisme eigenlijk allerlei stromingen aan het ontstaan, wat ook weer interessant is eigenlijk, dat hij heel erg met het virtuele bezig is, virtuele werelden. Daarmee misschien ook wel weer mind uploading bijvoorbeeld, ook het mogen kiezen van je eigen uiterlijk. Hij wil zichzelf mogen veranderen door cosmetische chirurgie, maar dan niet om jonger te lijken maar vooral ook om je

lichaam te kunnen hercreëren naar je eigen idee, je eigen smaak, je eigen dingen wat jij er van wilt. Ik ken deze persoon, waarvan ik vermoed dat het een man is niet goed genoeg, eigenlijk alleen via de mail. Ik heb wel 1 op 1 contact gehad over bepaalde zaken maar het is gewoon nooit tot een ontmoeting tussen ons twee gekomen. Daar is wel eens sprake van geweest maar dat is nooit gelukt. Daarnaast heb je natuurlijk de echte stroom van de harde singularitarians. In Amerika is dat natuurlijk vooral met bijvoorbeeld Eliezer Yudkowsky. Echt mensen die veel hebben uitgedacht dat kunstmatige intelligentie uiteindelijk zo hard zal gaan dat dat een zelfstandige stroming zal worden van een ras waarvan wij mensen alleen kunnen hopen dat wij daar geen last van hebben of daarmee zullen integreren.

*9. Het transhumanisme heeft zich volgens mij altijd vrij veel afgespeeld in de online sferen, Nu vertelde je in een eerdere mailwisseling dat de Nederlandse organisatie niet meer echt actief is en dat het zich meer plaatsvindt op Facebook en dergelijke. Wat vind je van deze ontwikkelingen?*

Mijn eigen idee is dat hoe prettig het ook is dat je daardoor met een grote community kan werken, ten eerste dat merk ik in ieder geval als ik met de groep van cryogene suspensie bijeen kom, daar heb ik eens per jaar bijeenkomsten van, uiteindelijk is het toch altijd goed om elkaar te ontmoeten. Dat je nieuws hebt en elkaar op de hoogte houdt dat je elkaar af en toe nog eens feliciteert met een verjaardag en dat soort zaken, dat is leuk. Maar het kan denk ik het echte contact niet vervangen, misschien wel een conservatief standpunt van mij, maar ik geloof wel dat je elkaar af en toe moet kunnen inspireren. Wat dat betreft is het erg jammer dat alle activiteit zich helemaal naar Amerika verplaatst, want daar zijn nog wel geregeld bijeenkomsten, zoals vorige maand nog een singularity summit, zoals dat dan zo mooi heet. Daar zie je al die mensen, maar het is voor mij gewoon niet te doen om even naar Amerika te gaan om daar bij te zijn. Ik heb met mijn werk en gezinsleven gewoon geen tijd om daar even heen te gaan en daar dan uitsluitend drie dagen over het transhumanisme te kunnen praten. Het is een inspiratiebron, je komt onder gelijkgestemden, dat zit je gewoon in je dagelijks leven niet. Onder je vrienden of wat dan ook, of m'n gezin, weten een beetje waar ik me mee bezig hou en we hebben het er ook wel eens over, maar je krijgt nooit het tegenspel van mensen die daar ook in gelezen hebben of eigen ideeën hebben, dat krijg je gewoon niet en dat heb je natuurlijk wel nodig. Dat is mijn eerste mening daarover en een tweede is dat met het steeds groter en groter worden, ook de vervuiling van de berichtgeving enorm toeneemt, mensen die over allerlei minder belangrijk of niet zo opzienbarende dingen praten. Dat was toen in 1997 toen ik zelf bij Transcedo kwam anders, dan had je het echt alleen over goede post en haalde je het niet in je hoofd om het over andere dingen te hebben die er maar zijdelings bij waren. Op de mailing list van cryonisten van Europa staan al 1000 mensen Je wil niet weten wat je daar allemaal aan vervuiling leest, aan mensen die elkaar zwart maken en het gaat dus over andere zaken

inmiddels en dat is jammer want het is al moeilijk genoeg. Het zou mooi zijn als het te beperken was tot een groep die er iets van weet en serieuze plannen heeft.

*10. Als ik het goed begrijp denk je dus dat er best wel wat actieve transhumanisten zijn in Nederland, maar niet meer zodanig georganiseerd, terwijl het in Amerika nog wel veel meer georganiseerd is, heb je een idee hoe dat kan?*

Het is misschien een wat grotere groep. Amerika heeft daar ook een aantal iconen rondlopen zoals Max More, Natascha Vita-More, mensen die daar echt heel ver in zijn. Anderen die dan niet in Amerika wonen zoals Anders Sandberg, die zitten in een positie dat ze er niet tegen opzien om even heen en weer te gaan naar Amerika, daar komt echt de grootheden van het transhumanisme bij elkaar. Maar de meeste mensen wonen in Amerika, want Amerika is natuurlijk ook een groot gebied. Ik zou het toch makkelijker vinden om even naar Londen of Berlijn te gaan dan even op en neer naar Amerika. Zowel qua kosten en als tijd is dat voor mij niet haalbaar.

*11. Transhumanisme wordt eigenlijk altijd een filosofie genoemd. Zie jij dat ook zo of zie je het eerder als een ideologie of misschien meer als levenswijze?*

Nou dan toch meer als een filosofie, het is meer een filosofie in het 'de technologie verwelkomen en uiteindelijk verwachten dat we tot een integratie daarmee zullen komen', voor zover dat nu al allemaal gaande is zou je het ook een levenswijze kunnen noemen. De andere die je noemde was ideologie? Dat zou ik het niet willen noemen, ik denk namelijk dat het ook staat te gebeuren.

*12. Je had al genoemd dat het wat meer mainstream wordt, maar denk jij dat transhumanisme net als het humanisme in de toekomst een meer geaccepteerde stroming zal worden? Of dat in ieder geval bepaalde ideeën ervan meer algemeen navolging zullen krijgen?*

Dat gevoel heb ik wel, een begrip zoals dat therapeutisch klonen, wat ontzettend ingewikkeld is en waarvan iedereen vroeger nog zei dat dat helemaal niet mogelijk was daar wordt inmiddels heel goed en nuchter over gepraat en zijn er ook televisie programma's over. Dan weet je dat het voor een breder publiek wordt. De meeste mensen, bijvoorbeeld ook mijn collega's, ik werk op een school, dat zijn geleerde mensen, maar zijn niet echt altijd met hun vak bezig. Ik geef les op een havo-vwo school, de mensen hebben dus wel een academische opleiding, dat ze eerstegraads bevoegd zijn, maar ze zijn niet meer academisch actief, ze houden weinig vakliteratuur bij, dat is mijn gevoel tenminste, maar hier hebben ze geen enkele moeite mee als ik dit zeg, dan vinden ze dat wel ok. Ik krijg ook eigenlijk van niemand te horen van wat jij wil dat invriezen, dat is

onmogelijk. Ze zeggen alleen wel dat ze het zelf niet willen. Dus men is daar wel heel reëel in dat het kan. Ik krijg heel weinig reacties dat het echt belachelijk is of zo.

*13. Ik hoor je toch ook zeggen dat de dingen die geaccepteerd worden ook meer de dingen zijn die bewezen zijn, maar wordt ook zo makkelijk gereageerd op ideeën over bijvoorbeeld mind uploading?*

Het idee van echt mensen klonen is natuurlijk een ethisch moeilijk verhaal, de meeste mensen accepteren dat het kan en dat de volgende stap is, maar mensen zeggen vaak ‘willen we dat’, of ‘moeten we dat willen’? Dat is natuurlijk de vraag waar ze mee aankomen en dat gaat dan onder andere over klonen, iets dat heel erg bedreigend is. Mind uploading dat is weer een ander verhaal, ik moet toegeven dat ik daar niet zoveel over praat omdat ik het gevoel heb dat dat ook nog wel heel erg ver weg zal zijn. Ik geloof zeker in de haalbaarheid van cryonisme en de haalbaarheid van moleculaire nano mind uploading. Ik denk dat dat dingen zijn die tussen de 50 en de 100 jaar werkelijkheid worden, maar mind uploading dat wordt niet binnen de 200 jaar voor mijn gevoel, ik moet zeggen dat ik geen argument heb om dat te zeggen, maar dat geloof ik gewoon. Dat is gevoelsmatig nog heel ver weg. En ik moet heel eerlijk bekennen dat ik het mind-body probleem voor mezelf daarin nog niet helemaal heb opgelost. Ik geloof vooral in de eenheid van lichaam en geest, ik ben boeddhist, materialist, hoe je het noemen wil, maar ik geloof wel dat mijn identiteit bepaald wordt door de structuur van de synapsen, dus de neurale verbindingen dus in principe zou je me dus kunnen overzetten en in principe zou degene die daaruit ontwaakt, als het echt een 1 op 1 emulatie is, mij kunnen zijn, maar ben ik het werkelijk? Dat is een vraagstuk wat ik nog niet echt heb opgelost voor mezelf. Daar ben ik nog niet goed uit.

*14. Wat maakt iemand eigenlijk een transhumanist? Is er een strikte definitie of is iemand die onderzoek doet op biotechnologisch vlak naar protheses ook een transhumanist?*

Ja ik denk dat inderdaad, het transhumanisme betekent letterlijk dat je in een tussenstadium bent tussen de mens en de post-mens, de posthuman. Als transhumanist zit je in dat tussenstadium. Tien jaar geleden dacht ik nog je bent gewoon iemand die daar over meedenkt, nadenkt en daar niet tegen opziet, maar inmiddels denk ik dat je wel kan zeggen dat zodra je bereid bent daar actief stappen voor te ondernemen als de gelegenheid zich voordoet en er niet tegen opziet om met extensies te werken in je lichaam, dus bepaalde dingen te laten vervangen of chips te laten implanteren, wanneer dat iets kan verbeteren aan de performance van je lichaam dat je dat zou doen ja. Dat ligt er natuurlijk aan wat je wilt, je krijgt dan natuurlijk de vraag willen we dat met sport? Als je nou een implantaat zou hebben waarmee je heel hard kan lopen of wat dan ook? Zelf denk ik daarover, mijn terrein is de muziek en ik werk heel veel met computer muziek daar zijn

fantastische programma's voor en daarmee kun je heel goed en heel mooi muziek maken, heel realistisch, maar ik vind het nog steeds leuk om wanneer ik mijn computer niet aan heb om akoestische gitaar te spelen. Dan kan ik me ook goed voorstellen dat als je een implantaat gebruikt om de performance van je benen je armen of wat dan ook of je gehoor of je ogen te versterken, daar meer mee te doen, dat je dan wanneer je gaat voetballen of hardlopen het uitzet, omdat je het nog steeds leuk vindt om als normaal mens te functioneren, als het tussenstadium, zou niet weten waarom dat niet kan.

*15. Je presenteert overal vrij duidelijk dat je transhumanist bent, bijvoorbeeld op Twitter en de verschillende websites die je beheert, doe je dat bewust?*

Ik doe het vooral bewust om in contact te komen met andere transhumanisten, het betekent dat je ook gevonden kan worden door mensen. Als je dat niet doet, dan kun je moeilijk die link leggen. Mensen willen graag weten wie je bent. Dus dat is heel bewust.

*16. Nou hoor ik je al een aantal keer noemen dat er in het transhumanisme verschillende gradaties lijken te zijn, zoals bijvoorbeeld mensen die geloven in mind uploading of kolonisatie van het heelal, ik heb zelf het idee dat er ook een min of meer verschil is tussen de meer ideologische en de meer praktische transhumanisten, zoals in de vorm van biobackers, wat is jou mening hierover, zie je het als transhumanisten?*

Ja, alles wat leidt tot eventueel een cyborg of alles wat daar tussen in zit dat noem ik wel transhumanisten. Ik zou het alleen zelf niet graag doen. Ik zal absoluut dingen doen wanneer het kan, maar het moet wel veilig zijn ik stap er niet bij voorbaat in.

*17. Dat is inderdaad een groot verschil, gezien zij proberen direct verbeteringen aan het menselijk lichaam te krijgen door middel van experimenteren.*

Er is bijvoorbeeld een heel mooi online boek van Alex Remonsky, *I've Changed My Mind*, het boek is online te lezen. Dat gaat echt met name over zijn brein hacken. Dat is absoluut interessant om te lezen wat hij allemaal kan en wil en het zou fantastisch zijn als je zo ver kan gaan dat je zoveel te vertellen hebt over je gevoelens en wat je wel en niet kan herinneren. Maar ik zou de experimenten niet graag doen. Hij is overigens wel zo fair dat hij daar zelf ook voor waarschuwt, hij doet het zelf wel, maar hij zegt ook dat het niet zonder gevaar is. Iemand anders die daar erg in de buurt zit is David Pearce, dat boek heet *The Hedonistic Imperative*, dat is een wat ouder boek en die beschrijft het vooral voor drugs. Dus inderdaad hoe je gevoelens wel of niet kunt verbeteren of versterken. Niet van een jointje roken en je dan goed voelen, maar echt heel gericht je gevoelens hacken en kunnen

manipuleren. Een bijzonder boek maar wat wel heel ver gaat. Dat laatste is echt bekend in transhumanisten kringen, ik kan me niet voorstellen dat iemand het niet kent. Dat staat ook echt al jaren online.

*18. Ik heb tot dusverre weinig tekenen van praktisch transhumanisme in Nederland gevonden, klopt het dat dit niet of nauwelijks voorkomt hier? Waardoor denk jij dat dit komt?*

Wat zou je praktisch transhumanisme noemen?

*19. Ik heb het dan nu vooral over biobackers, mensen die zelf experimenten doen om het lichaam te verbeteren.*

Dat zou ik niet weten wie dat is, of iemand dat in Nederland doet. Ik doe het dus zelf niet, daar ben ik ook niet voor in de mood. Ik vind persoonlijk cryonisme al een behoorlijk praktisch iets, want dat is namelijk wat je op dit moment kunt doen om in ieder geval een kans te hebben om mee te mogen doen in de toekomst. Het beste is natuurlijk onderzoek doen, ik ben wel geïnteresseerd in technologie, heb ook een beta opleiding van de middelbare school gehad, dus ik ben voldoende wiskundig en natuurkundig onderlegd om gewone geschreven vakliteratuur te kunnen begrijpen, maar ik ben nou eenmaal muzikant en geen wetenschappelijk onderzoeker, althans niet als het om technologie gaat. Ik kan dus helaas niet meedoen in dat onderzoek wat allemaal gaande is, ik ben al blij dat ik het kan volgen.

*20. Zoals we net al bespraken met bijvoorbeeld mind uploading en kolonisatie van het beelal, lijkt het erop alsof er ook een verschil is in de realisatie droom bij transhumanisten. Klopt dat?*

Eigenlijk realiseer ik me net, er is nogal heel wat aan de gang. Wat echt al heel lang speelt bij de transhumanisten is een soort geïntegreerde intelligentie, als we ooit in een upload situatie zouden zitten, is het heel makkelijk om jezelf te kopiëren of als swarm in virtual reality of cyberspace kunnen mixen met anderen, en eigenlijk is dat proces al heel lang aan de gang. Als je bijvoorbeeld kijkt naar smartphones, ik kan me herinneren dat ik een jaar of tien geleden een interview had voor radio 1 van de KRO over mijn invriesplannen. En toen heb ik nog een verhaal gehouden, omdat je toen nog gewoon achter een grote home computer zat, dat ik me kon voorstellen dat er een moment zou komen dat dat ding rechtstreeks op je hersenen aangesloten werd en dat de laatste stap zou zijn dat het rechtstreeks in je hersenen geïmplementeerd zou zijn, of omgekeerd je hersenen in die computer. Maar als je eigenlijk gaat kijken wat er sindsdien gebeurt is, ik zie onder mijn leerlingen bijvoorbeeld, wel allemaal kinderen van ouders die het financieel goed hebben, die hebben allemaal een smartphone of een iPad of een Android, maar eigenlijk zijn ze allemaal non-

stop online. Ze zijn non-stop connected met elkaar, nou gebruiken ze het weliswaar om vreselijke flauwekul naar elkaar te Twitteren en te Whatsappen. Maar in feite is dat al een behoorlijke stap in de richting van integreren. Ik merk ook dat als ik over dit soort dingen praat mijn collega's het nog wel een stap vinden, maar het is al aan de gang. Dat is mijn idee daarover, dat is ook wat ik bedoel met mainstream. Het is een hele langzame verschuiving naar dat het steeds kleiner wordt en dat het niet meer zo is dat jij als je opstaat 's ochtends en nog inlogt op je computer. Ik denk dat jij dat nog wel eens zou kunnen meemaken, jij bent praktisch opgegroeid met de computer. Ik had nog dat ik mijn eerste computer kocht en een eerste modem, en dan stond ik 's ochtends op en dan ging ik inloggen om te kijken of er nog email was. Je moet er niet aan denken dat het nog zo zou werken op die manier, het is echt een andere wereld. Het is al vrijwel geïntegreerd, behalve dan dat er nog een paar mensen zijn die het niet hebben, maar mensen hebben het gewoon en vinden het de normaalste zaak van de wereld, dat je alles maar kan zien en kan weten waar iedereen zit. Dat is geen echt transhumanisme, het is een vervagende grens en ik denk dat het op die manier heel langzaam aan het ontstaan is. Dat andere, dat biohacking, dat hoort er denk ik ook wel bij want dat is natuurlijk iets wat je bijvoorbeeld hebt als je kijkt naar de Paralympics, mensen die gewoon al met een exoskelet werken of lopen en daar wedstrijden mee houden, het zijn heel geavanceerde dingen. Vroeger kreeg je gewoon een stok als je been geamputeerd was, en daarna werd het iets dat er uitzag als een been en de knie kon een buiging maken. Nu weten ze exact op welke punten spieren zitten en dat kunnen ze allemaal, als je het heel duurt maakt, zo aansluiten dat het werkt. Dat zijn allemaal stappen in die richting, ik kan het niet anders zien dan dat.

*21. Je staat dus ook ingeschreven voor cryonics. Ik heb het idee dat deze beweging aan populariteit wint, klopt dat?*

Nou ja dat is een groot woord, ik merk aan de mail die binnenkomt niet dat het nou echt veel meer is dan dat het vroeger was. Hier in Nederland krijgen wij eigenlijk nauwelijks mensen er bij die zeggen dat wil ik ook, het komt wel eens voor, maar die zetten niet door. Er komt eigenlijk nooit iets van terecht, maar het is wel zo, je krijgt geen boze of geen reacties meer. Dat komt denk ik omdat het iets is dat gaandeweg steeds duidelijker wordt dat het zou kunnen. Als je bij het invriezen niet al te grote fouten maakt, dan gaat het niet meer fout. In het Volkskrant interview met Henry Sturman en mij, het is een vrij goed artikel, alhoewel ze mij en Henry in het begin even verwisselde. Verder is dat hele interview, waar we ook wel veel tijd in hebben gestopt en hier en daar ook wat hebben bijgestuurd, een goed artikel geworden. Dat is wel even iets anders, als je zoiets een paar jaar geleden deed, dan kreeg je echt een beetje rare reacties en vragen waarbij je toch ook echt wel moest zorgen dat het goed kwam in dat blad met wat ze gingen zeggen, want onder het mom 'het moet wel populair gesteld worden'. Elke keer werd bijvoorbeeld de wetenschapper aangehaald die zei dat je een hamburger kan invriezen en ontdooien, maar het wordt toch nooit meer een koe. Een

hamburger is al gemalen vlees, wanneer je je laat invriezen laat je niet je hersenen door elkaar malen. Hoop toch dat die toestand behouden blijft. Maar iedere keer weer kwamen dat soort anekdotes die echt al twintig jaar oud zijn, weer naar boven. Inmiddels is dat wel voorbij, dat zie je niet meer. Het enige wat je nog wel eens hebt is dat mensen zeggen ‘dat is toch alleen voor hele rijke lui’, en ook dat is dus gewoon niet zo. Je moet uiteraard wel geld hebben, maar het is zeker te betalen. Voor het geld van een behoorlijke BMW hebben we een invriescontract, zal ik maar zeggen. En er rijden toch zat mensen in een BMW. Daarvan zegt niemand hij is schandalig duur, iedereen zou een BMW moeten hebben. Het is maar net waar je je geld aan wil uitgeven, dat is het eigenlijk.

*22. Je hebt zelf zo'n invriescontract, doe je dat om meer van de toekomst te kunnen zien of wil je echt onsterfelijk zijn? Want hoe zit het dan bijvoorbeeld met je familie heeft die ook een dergelijke contract?*

De familie heeft het niet, ze weten het van mij. Mijn kinderen bijvoorbeeld die weten het ook, maar geen enkele aanleiding dat ze zeggen ‘dat zouden we ook wel willen’. Mijn vrouw die weet er ook van, maar die gaat het ook niet doen. Terwijl ze op zich wel denkt dat het zou kunnen. Ik heb ook tegen haar gezegd, mocht ik als eerste dood gaan dan moet er iemand een telefoontje plegen, en ik wil vragen of jij dat wil doen. Er moet dan toch een telefoontje gedaan worden om alles in gang te zetten, nou daar heb ik het ja woord op gekregen, en dat was eigenlijk alles. Verder, zou ik het leuk vinden als ze meeging, maar als ze dat niet doet ga ik toch. De belangrijkste reden is, ja ik hou toch zoveel van mijn leven dat ik bijvoorkeur niet dood ga of op z'n minst heel veel langer zou willen leven. Op de tweede plaats omdat ik inderdaad erg graag zou willen weten hoe het er in de toekomst uitziet. Want ik vind eigenlijk dat als ik nu kijk wat er gaande is, en dat komt misschien in mijn leven boven, het wordt echt steeds leuker. Ik bedoel er zijn op dit moment dingen aan de gang die ik als kind van 12 jaar al wilde, dat wordt steeds meer werkelijkheid, dat vind ik gewoon fantastisch. Het kan alleen maar beter worden denk ik dan.

*23. Er is duidelijk een onderscheid waar transhumanisten in geloven voor de toekomst, maar het feit dat jij cryonics nastreeft, betekent waarschijnlijk niet dat je niet ook geloofd in bijvoorbeeld het beheersen van celdeling of andere technologische mogelijkheden om het menselijke leven te verlengen of onsterfelijk te worden*

Ja uiteindelijk dat invriezen is natuurlijk mogelijk om even de brug te slaan naar het moment waarop ik na de gemiddelde levensverwachting dood zou gaan en het moment waarop we dan zover zullen zijn dat we al die ziekte kunnen bestrijden, alles wat de aanleiding geeft tot het verouderingsproces en daarmee natuurlijk het doodgaan, dat moet natuurlijk gerepareerd kunnen worden, of ongedaan gemaakt kunnen worden. Dan valt te denken aan de korte telomeren, het alzheimer probleem, het vernauwen van bloedvaten, kanker, de mitochondriën die uiteindelijk hun

afvalstoffen in de cellen storten waardoor steeds weer vervuiling optreed, al die problemen die kunnen ooit opgelost worden, maar niet nu. Voor alzheimer verwachten we binnen tien jaar, andere gaan misschien iets langer duren. Telomeren wordt al heel lang over gepraat, dus de eindes van de DNA streng die zorgen voor de juiste codering bij celdeling, maar dat wordt elke keer een beetje korter en dat is eigenlijk daarbij automatisch je biologische klok, op het moment dat die telomeren op zijn als het ware dan gaat er steeds meer fout bij het kopiëren en daardoor kunnen eventueel tumoren ontstaan. Dat is min of meer je ingebouwde biologische klok en dat moeten we zien uit te schakelen of verlengen, die telomeren. Het enzym telomerase bestaat in de praktijk, dat weten ze, bijvoorbeeld van kankercellen omdat die geen last hebben van veroudering dat is tegelijkertijd het vervelende van kankercellen, maar als je die eigenschap zou kunnen overnemen voor andere cellen dan zou je in ieder geval, niet meteen onsterfelijk, maar het zou wel een bijdrage zijn aan het tegengaan van ouderdom. Maar goed het gaat allemaal te lang duren, voor mij zeer waarschijnlijk dan, tenzij er een wonder gebeurd is. Ik zie cryonisme niet als een doel op zich, maar wel als een middel om deel te nemen aan de toekomst waarin ze dat wel kunnen allemaal. Er zijn bijvoorbeeld een aantal hele jonge transhumanisten die inderdaad niet aan cryonics doen, omdat ze denken 'ik ben nog zo jong, tegen de tijd dat het voor mij gaat spelen zijn al die problemen wel opgelost'. Het is risico natuurlijk, want je kan altijd nog onder een tram komen, maar aanvaardbaar.

*24. Je zei het net zelf eigenlijk net ook al, ik vroeg me af of cryonics niet ook een vorm van praktisch transhumanisme is omdat je toch zelf het heft in eigen handen neemt om iets te veranderen aan je toekomst.*

Ik denk dus dat dit het enige is wat je op dit moment kunt doen en daarnaast is het natuurlijk inderdaad dat mijn aandeel in dit geheel is mijn website, waarop ik de kennis die ik vergaar over transhumanisme, die deel ik met andere mensen, bijvoorbeeld door dit interview, maar ook door de website, of door er over te schrijven of wat dan ook. En dat beschouw ik als praktisch transhumanisme. Mijn lidmaatschap van de marsociety staat een beetje op een laag pitje op dit moment, maar dat was voor de ruimte kolonisatie natuurlijk een stap dat je mensen helpt bewust maken dat ze dat toch wel zouden moeten doen als we gaan proberen met z'n allen te overleven en als mensheid te overleven, dan is vroeg of laat kolonisatie van de ruimte nodig en alles wat daar voor mogelijkheden bij zit en dan beschouw ik bijvoorbeeld mars als een kinderoefeningetje, kolonisatie van de maan is niet zo interessant behalve om daar misschien grondstoffen vandaan te halen, maar op de maan zou je niet kunnen wonen. Op mars wel dat is nog wel een reel iets wat we met de hedendaagse technologieën al zouden kunnen. Het is eigenlijk een probleem van de politiek dat we het niet doen, maar dat zou op dit moment gewoon kunnen. Verder weg gelegen objecten natuurlijk nog niet, maar je moet natuurlijk op een moment gaan beginnen en je ontwikkelen. Ik

probeer dat onder andere bij mensen in te leggen, maar ik ben daar natuurlijk niet de enige in. Er zijn natuurlijk zat andere mensen die dat doen en misschien nog wel beter, dat weet ik niet.

*25. Wat voor invloed heeft het transhumanisme en cryonics op jouw dagelijks leven?*

Ik was het natuurlijk eigenlijk al, op een gegeven moment ken je het woord en ken je andere mensen die ook zo denken, dat is een prettige ervaring omdat ik toch in mijn jeugd aardig getobd heb met mijn ideeën omdat er niemand in mijn omgeving was die zo dacht. Ben ik dan gek of hoe zit dat, waarom gaan we dit soort dingen niet doen? Waarom willen we dat niet? Daar kreeg je nooit enige respons op van jeugd in mijn omgeving. En dat is gaandeweg wel sterker geworden en ik heb nu meer vertrouwen gekregen in dat die ideeën zo gek nog niet zijn. Maar op zich leef ik zoals altijd geleefd heb en vergeet ook niet dat ik nog altijd in het heden zit. Ik doe nog steeds de gewone dingen die er op dit moment zijn. Dat vind ik ook oké.

*26. Je had het er nu een paar keer over dat je dit soort gevoelens ook al in je jeugd had, waren dat dan meer ideeën over 'we moeten door middel van technologie beter worden, of het menselijk lichaam overstijgen' of was het ook meer met een soort drang tot onsterfelijk worden.*

Dat was het zeker mind uploading had ik toen nog niet zo erg over nagedacht, dat was toen nog wel een stap te ver. Maar een fenomeen als de computer dat ik op mijn twaalfde al las dat die er aan zat te komen, hij was er toen natuurlijk al wel bij dingen als de NASA maar dan praat je over bakken die muren in beslag namen. Over invriezen heb ik op mijn vijftiende voor het eerst gelezen in een artikel, tijdens een vakantiebaantje. Ja dan ga je daar over nadenken, als dat kan zou ik dat toch graag doen. Maar daar werd natuurlijk verder niet over gepraat in Nederland en al dat soort begrippen kwam ik pas tegen toen het Internet er was. Dan blijkt natuurlijk dat er meer mensen zijn die dat wel doen. Dus nee, er is voor mij niet veel veranderd in hoe ik er persoonlijk over denk, maar je weet waar je het over hebt, doordat je met andere praat versterkt je zelfvertrouwen, maar je krijgt ook nieuwe kennis. Mind uploading is dus typisch iets dat ik geleerd heb en dingen als Second Life, dat is eigenlijk ook al weer een tussen stap naar de virtualiteit. Daar kon je als kind nauwelijks van dromen. Ik las als kind al wel veel science fiction, dus bijvoorbeeld een mobiele telefoon of alles dat portable was dat waren dingen die werden toen al gewoon beschreven. Je moet niet vergeten dat dingen die werden vijftig jaar geleden beschreven, ik noemde net even Isaac Asimov, dat was een science fiction schrijver die voor zich zelf als doel had dat het moest kloppen, als het niet mogelijk is op dit moment dan moet het in ieder geval mogelijk zijn, het was heel duidelijk dat het in principe theoretisch moet kunnen. Dan schrijft hij dus zo'n boek in de jaren vijftig, en we zijn nu bijna zo ver dat dat geen belachelijke ideeën zijn. Dat zijn wel mooie dingen.

27. *Heb je nog dingen die je wilt toevoegen, of waarvan je denkt dat ik ze heb gemist?*

Nee, ik zou het niet meer weten. Weet je wat het is, als je gewoon nog iets tegenkomt, of wanneer ik nog aan iets denk dan hebben we nog contact. Ik antwoord zo snel mogelijk en ik blijf graag op de hoogte van wat je gaat doen.

## 8.2 Interview Aubrey de Grey

1. *You did not originally start in biogerontology, when and why did rejuvenation or perhaps even immortality start to play such an important role in your life and work?*

I had understood from my earliest days that aging is (a) bad for you and (b) potentially amenable to medical intervention. The big revelation was when I was about 30 and began to realize that most people, even most biologists, didn't think about aging that way. I was totally horrified, and eventually I accepted that my only rational option was to switch from artificial intelligence research and become a biomedical gerontologist.

2. *You are often called a transhumanist and are a well known name for the followers of this philosophy, but do you actually feel a transhumanist?*

Not really, no. I'm a practical, first-things-first sort of guy. I want to stop people from getting sick as they get older. That's not really particularly radical.

3. *How did you come into contact with transhumanism?*

As soon as my work, and particularly the extreme nature of my expectations/predictions concerning the ability of foreseeable regenerative medicine to extend healthy life, became known online, I became very much a darling of the transhumanist community. That was a few years before I came to the attention of the media.

4. *What is transhumanism according to you?*

That's a hard one. I guess I'm more happy with Julian Huxley's definition than Max More's: I think of it as a philosophy promoting/propounding continual effort to expanding our capabilities and environment, as a route to improving our quality of life. Saying it that way makes it sound a bit

mundane, I guess! Maybe what distinguishes transhumanism from simple advocacy for technological progress is that transhumanists think about the long term as well as the shorter term.

*5. What makes someone "a transhumanist"? Is someone working on for example technologically advanced prosthetics also a transhumanist?*

I'd say that what makes someone a transhumanist is their interest in extrapolating current efforts to develop new technology into the more distant future. So someone working on prosthetics might or might not be a transhumanist.

*6. Do you notice a difference in transhumanist approaches over the world?*

No. It's a very cosmopolitan movement: transhumanists from all parts of the world speak very much the same language and have very much the same priorities.

*7. Is transhumanism for you a philosophy, an ideology, or is it more or less a way of life, and why?*

Heh - that's a very hard question for a practical guy like me! I'm not really sure I see much of a difference between the three alternatives. Isn't ideology what defines one's way of life? And isn't one's philosophy (one's ethical philosophy, anyway) the same thing as one's ideology? For me in how I actually live, I think I can definitely say that these three are all pretty much the same thing. But then, as I said, I don't really consider myself a transhumanist.

*8. Do you think transhumanism is becoming more mainstream?*

Oh yes, for sure. Thought leaders like Ray Kurzweil are gaining readers all the time.

*9. It seems there are different approaches to transhumanism, your work on the SENS strategy is quite different from for example mind uploading. Do you also see these as different approaches to a similar goal or are they more distinct than meets the eye?*

I don't think one can generalize too much here. I think the only thing one can say is that there are different approaches to particular goals, such as elimination of aging. Maybe one can say that some approaches to a given goal are more transhumanist than others - and maybe that some goals are more transhumanist. But really I don't know. I don't honestly care whether the goal of defeating aging is transhumanist or not.

*10. How do you feel about these other transhumanist dreams, you focus mainly on biological solutions for rejuvenation, how would you feel for example about mind uploading?*

I see it in terms of what it would achieve. There's clearly the possibility (though I currently consider it unlikely) that mind uploading will turn out to be easier than SENS. If so, I will be very interested in being uploaded as a way to preserve myself and avoid the debilitation of old age. As things stand I like being made out of meat, but if I need to sacrifice that in order to carry on being made out of anything, so be it.

*11. And what about micro nano technology, an area that might be a bit more in your area of expertise?*

Actually it isn't - I'm embarrassingly ignorant about that area. But the same applies. I can see ways in which molecular manufacturing could help to postpone aging, and at present I think that approach is a lot further off than SENS, but I know I could be wrong, so I'm delighted that very smart people are pursuing it.

*12. Are you known with the phenomenon of biobackers? (people experimenting with DIY implants to improve certain human senses) Do you think these biobackers are also transhumanists?*

I'm familiar with that movement, yes. Certainly it has a lot of commonality with transhumanist thought. Whether such people are transhumanists, honestly it's not for me to say.

*13. You have also written some publications on caloric restriction, and said it might probably 'only' add 2-3 years. What do you think of this or other body hacking activities in the light of transhumanism?*

It's all about practicalities. Modest postponement of aging is not to be trivialized - it is better than nothing, and it gives people the possibility to stick around for long enough to benefit from better technologies.

*14. How would you explain this urge to quantified self and taking the prolonging of life in your own hands.*

I don't think there's much to explain. It's normal for people to look after themselves; QS is just doing it more assiduously.

*15. Is this phenomena a new thing?*

Not really - it's just more overt now, because there are more tools to do it with.

*16. You are also registered for cryonics and gave an elaborate presentation in 2007 on whether or not a biologist should publicly support this. How do you feel about cryonics today, is the acceptance changing?*

Yes it is, but too slowly. It's completely clear that by rapid cooling, using appropriate cryoprotectants, we can in principle arrest the decay of biological material before it has significantly progressed beyond the point where the organism's heart was still beating. Thus, it is insane to believe that people who have benefitted from that arrest can never be revived. The public and professional resistance to cryonics is ultimately irrational - it's based on our deep-seated attachment to the idea that people need to be either alive or dead and not somewhere Schrodingeresquely unknown in between.

*17. Why did you sign up for cryonics?*

Simple: it's health insurance. I want to benefit from the best technology that can maintain and extend my health. If I have to spend a little while unconscious before being restored to health, I'm up for that - just as anyone would be happy to submit to a medically-induced coma if that were what the medical professionals caring for them thought was best.

*18. Is perhaps the concept of longevity escape velocity based on a similar urge to postpone death and to see other possibilities arise, or is LEV for you a final goal?*

Neither. LEV is just a very obvious side-benefit of my work. I work to maintain people's health. It's just a simple mathematical truth that therapies which rejuvenate people (make them less damaged than before) will buy time and give a very good chance to develop better therapies in time to stay one step ahead of the problem.

*19. Does transhumanism or cryonics influence your daily life?*

Not really. I just grind away on getting SENS implemented.

20. *Colonizing the universe is also a more often heard theme in transhumanism, how do you feel about this? Is it something inevitable that comes with an indefinite lifespan?*

Well, probably there will always be explorers among humanity, so yes, I think it's likely that as we bring aging under control there will be people who make use of their longevity to travel far from Earth. For myself, however, that's not a goal. I've never been particularly adventurous - I like the life I already have.

21. *Is transhumanism as a philosophy becoming a bit obsolete, since so many activities might be accorded as transhumanism?*

Interesting. I would say that if the term "transhumanism" is being used for more and more things, that probably says that it is becoming the opposite of obsolete! But maybe new terminology would be useful. It's similar to the term "nanotechnology": in the original Drexler days we all knew what that word meant, but then it was co-opted by those working in nano materials, to the extent that these days if you want to talk about Drexlerian technology it is safer to use the term "molecular manufacturing".

22. *It is said that transhumanism is the stage between the human and the posthuman, when do you think we will reach this 'final stage' and what will this exactly be?*

That's Max More's definition, but as I said earlier, I feel more comfortable with Huxley's. I don't foresee any "final stage".

23. *Will transhumanism still exist once we're 'immortal' or have an indefinite lifespan?*

Oh yes. Transhumanism is all about what technology can do that it can't do yet, and there will be no end to that.

### **8.3 Interview Kevin Warwick**

1. *You are often called a transhumanist and are a well known name for the followers of this philosophy, do you actually feel a transhumanist?*

It's more a different group of people, if you see what I mean. Because I'm much more practical and technological, just getting on and trying things, and sometimes what they say in a conference, when I've been there, I get up and say well this is absolute rubbish. Which I think annoys them

somewhat, or when I say ‘yeah we’ve done that’ and then that annoys them. I think that to some extent I upset them a bit, hence it doesn’t fit like that so well. So I don’t really see myself as one of that group, but if you look at what a transhumanist is supposed to be, then clearly I’m in the practical end, in trying things and see what happens.

*2. I asked the same question to Aubrey de Grey and he said a similar thing, that he does not truly feel a transhumanist.*

I would perhaps put myself in a class with Aubrey de Grey. We’re probably both guys that get on with it and talk about it but don’t fit in. We fit together probably, but we don’t fit in that. I respect very much what he is up to, what he thinks, how he talks, I like it very much. I’m sure he made a good contribution to what you’re doing.

*3. This is also somewhat what I’m trying to find out. Many people are considered to be a transhumanist when they perhaps don’t feel like one. It’s a bit a conflicting concept which is both a philosophy and a label that is attached to people that are trying to transcend certain boundaries of the human body.*

So do I regard myself a transhumanist... I guess, well it’s not something that I wake up in the morning thinking ‘oh I’m a transhumanist’. I wake up in the morning excited by the science and let’s do this experiment, but I realise that in some of the experiments that I am and have been involved with, that that could easily be an end result. If this is successful and that is successful. Yes it’s going to change, whether it’s changing the human form into a different type of human, or whether it is like a posthuman. And because of the intellectual changes, people with that kind of implant or that type of ability then will think in a whole different way to humans and it will be like a new species. I think there are genetic possibilities, we’re not sure what is the nature of evolution, is it a Lamarckian evolution, or a Darwinian evolution, so it depends a bit on that to whether you think transhumanism ultimately will mean posthumanism. So I do see myself as an experimenter, but I’m not bothered by classifying ‘I am a transhumanist’.

*4. How did you come in contact with transhumanism?*

I did get an invite to one of their conferences many years ago, I mean the group that call themselves transhumanists. I got an invite to a conference so I went along and gave a talk and realised that my talk was quite strange as far as everybody else was concerned and I didn’t stick around to long. So that’s it, it was down in London, I think that it was some of the guys that are now up at Oxford, Anders Sanberg, Nick Bostrom, I think he was one of those in that time. So

that was when I got involved, because I guess they saw that I was doing some stuff that seemed to be relevant to what they were talking about. But how I got involved with the research, then we go back to when I was little and so on.

*5. You already somewhat mentioned it, but I have come across several definitions of transhumanism, what would your definition be.*

I'm not a great guy in definitions, well this is a fuzzy definition. I would think that transhumanism is changing the human form, changing human abilities. My take on it, is more the mental and neural abilities, so I'm not so much interested in the physical side of things. So, to me transhumanism is changing the way the human brain works, hopefully making it much more capable in different ways. That can mean, using pieces of technology to upgrade how it works, or it could mean using other biological things to make it work, adding braincells and things like that. So that would be my take on it, I know it is not a good definition, but that's somewhat my view. I will answer a different question, my definition of a cyborg. Cyborg of course, different people have described it, even people riding a bike is a cyborg, Andy Clark said we're all cyborgs because our brains are affected by technology. So you get into what, I like Andy very much, but a quite silly definition is, 'we're all cyborgs'. Then there is no point in having a cyborg in the first place, we are all what we are. But my take on that is the type of cyborgs that I am interested in, where you have technology that is integral with the person, particularly with the brain or the nervous system, that then gives you extra abilities. So yes I am interested in helping people therapeutically sure, but my main interest is looking to enhance. And that in a sense for transhumanism is the same, it's looking whether there is technology integral with the person. So it's not like glasses, that's someone wearing glasses, that is not a transhumanist. So it is integral with the person and it gives you extra abilities, you enhance, you upgrade it. And I think the same would be true when it comes to transhumanism, that's what I'm interested in.

*6. Aubrey de Grey stated that he thought more of transhumanism in the way that Julian Huxley once defined it, I'm not sure if you're known with his ideas, which are more focussed on an overall upgrading of the human, not so much purely technological or physical as the ideas of Max More of Extropy are closer related to. I was wondering what you think of the difference between these two.*

I'm not known with these ideas, but I'm very much specific, technically oriented, so it's looking at very specific things, not so much general or the public or anything like that.

*7. You already said that concerning to you someone is a cyborg when they are upgraded by integral technology, and what would you say that makes someone a transhumanist? For example is someone working on technologically advanced prosthetics in a medical way also a transhumanist?*

I think that where it is therapeutic or trying to overcome merely a problem that somebody has, I really don't see it as transhumanist, I don't really see it like the cyborg, which is more a science fiction concept, the cyborg that I agree with. The same would be true for transhumanists. Having said that, of course with the technology comes certain possibilities, if we take the cochlear implant, that is a good example, that is something that is in theory helping someone overcome the hearing problem and it typically might give back eighty percent of the hearing that you could have, but it has the potential there to increase the frequency range, it has the potential that you can plug your ears directly into the Internet, for example. You could I don't know whether anybody ever tried it, but it does open up that possibility. Therefore it is giving you a capability that you could become a transhumanist, so because of your disability in a sense, you link yourself with a bit of technology, because you don't care, and therefore you can do some experimentation that can make you a transhumanist. Suddenly instead of having a frequency range of 15 kilohertz, you have a frequency range of 115 kilohertz. Which nobody else has, you can change the way in which you communicate, which is important. So, I think that on the one hand I would not practically, realistically in an immediate sense see that area as transhumanist, but it may well open up an easy access route that does allow you to do that in a practical sense. But I'm thinking in a really practical sense. Wouldn't it be good to try that? I have a friend who has a cochlear implant, I'm trying to convince her just of that, but ethically it is probably entirely incorrect and inappropriately, so I didn't mention it to you...

*8. You have spoken on many conferences, also transhumanist events, you are quite hailed as being a transhumanist speaker....*

Whether I like it or not (laughs)

*9. Yes you seem to be stuck with a label. Have you noticed a difference in transhumanism over the world.*

I will answer that in a second, in time I have yes. Because I think fifteen years ago it was a bunch of philosophers really, they would regard it as a bunch of strange philosophers. I mean it was a bit of a weird group and so on. A lot of them are still there, but they have come more of age. In those days to mention human enhancement... I went to a conference it was in Holland and it was a very official government thing on human enhancement. I thought 'ah this is exciting' and what it turned out, it was to do with disabilities and their regard to human enhancement was, somebody who's lost

their leg we'll give an artificial leg and they individually are enhanced. And I was gone preparing this thing 'yeah we're all going to communicate in a whole new way and you know, new senses and so on', I was right out of it. But other than that, human enhancement in terms of enhancements, you couldn't really discuss fifteen years ago, you would be a bit weird or crazy. And even when I had my implant in 2002, never mind the 1998 one, to some news thesis that was strange, the Telegraph didn't go near it, it was just too... I mean I knew Robert Hulick who was the main technical science reporter at the time and he was saying 'look I know what you are doing Kevin, but our readers they are going to find this so way out there' so they didn't report on the thing, and yet a couple weeks before that they reported on some rat getting electrodes, that was alright, rats having electrodes was fine, humans doing stuff like that, you just couldn't report. Now of course there are conferences on human enhancement, so I think in terms of the transhumanist movement, they were fifteen years ago a real weird group of people, that's how they were regarded, whereas now I think they are much more mainstream, with a lot of people, it can appear in the newsthes. Maybe for some of them it has lost a bit of its academic edge because of that, but was that the question?

*10. Well, you already answered two other questions I had, but I asked if you noticed a difference in transhumanism over the world.*

Ok well time has changed, but in terms of the world, I think clearly it was more something... If you look at the people such as Natasha [*Vita-more*], people that were involved, they were mainly western people. I think there have been and still are people interested in China or in Asia, South America and so on, but they're more individualistic. The Internet has been fantastic, the web has been fantastic in empowering them to be part of the overall international picture, but clearly it's not a level playing field. I think that the technology that is available to play with is very different if you look around the world. In China still you can't get Facebook and things like that so the access to information and this sort of thing is still a bit avant garde, it still a little bit out there. Hence, so in some countries it is not so easy to have conferences, and I'm not sure whether a transhumanist conference has been in china yet, but probably not. Certainly when I go out there you look at the audience and they go like (gasp), 'can someone really say this stuff, do this stuff?' 'Is this guy for real' that kind of stuff. So I can imagine transhumanists internationally there are still going to be some areas due to political pressures and so on, where it is still not really accepted. Clearly I think it is pretty broad.

*11. Do you think there has come a greater diversity of approaches that are called transhumanism? For example looking at mind uploading, cybernetics, biogerontology, and that kind of areas?*

Yeah, I think so, I mean the mind uploading, Hans Moravec talked about it quite some time ago, but again when he talked about it, it was sort of ‘wow you are a bit weird’, and he probably was a bit weird if you ask, but it was a little bit out there, this is not realistic, this is some theoretical thing. Whereas now I think people have halve a mind to think ‘well hey maybe’, now the discussions on it are more realistic. What would it mean in practice, even from a more philosophical point of view it has become more grounded. So I think, that, it definitely has diversified and taken on board with genetics, with biological culturing, with DNA modification and technology getting smaller and smaller. So it has become a lot more diversified and maybe the practical influence of what is actually there technically. And I guess the philosophy has moved on as well. Some things like what Aubrey is doing, like living forever, again fifteen years ago saying things like that... People probably said ‘Aubrey you’re crazy’, whereas now people look at the practicalities of it, look at the statistics of it, and say ‘well hold on a minute, Aubrey has got a bloody good point there, how can we go in that direction?’. So I think it has become much more realistically grounded, but has taken aboard a broader spectrum yes. One thing, the last meeting I went to, where Aubrey was at, the main focus was on chemicals, drugs, Modafinil. Transhumanism was all about taking Modafinil, ‘oh I’ve taken it, I’m a transhumanist’. There was a bit of that going on, well maybe they are, but it was mainly that. If you went back and talked to Aubrey again he would say ‘yeah I can remember that, it was mainly chemical’. But to the both of us I think it was a bit strange, I mean chemical thinks like that are things people can just try it, it is sort of legal and everyone can have a go and ‘oh yeah I’m feeling a bit weird I’m a transhumanist’. But maybe they are, I don’t know. Chemicals is one aspect to the doctor Jekyll and Mr Hyde kind of scenario. He was, although a fictional person, a bit of transhumanist himself. All I’m saying there seems to be, in the transhumanist conference thing, a bit of a bias towards that sort of things. Various people like ‘oh I tried Modafinil what do you think’, ‘oh I tried it, where did you get it from?’ and there was a bit too much of that for me. I’d preferred to hear more of what Aubrey had to say, more on the technology side. We were more dragged in as party pieces, ‘Somebody’s got to talk about it, we don’t really want to, but somebody got to talk, we really want to talk about Modafinil’ so it felt a bit like that I guess (laughs).

*12. That is actually a good point, I have been studying what kind of approaches there are to transhumanism, and I had not yet thought about a chemical perspective.*

Certainly it is where you stop with it. Because, if you look statistically there have been a lot of IQ studies. They say that IQ has to do with intelligence, and so on, but let’s assume there is a link

between an IQ test result and how your brain works, take that just for a moment and assume. Lots of studies that have been done in terms of, where you live, what you do in your life, what kind of lifestyle you have, what you eat, and so on, and how it affects IQ results. Now if there is some link between IQ results and how the brain works, your intellectual capabilities, then maybe you can say, that this in a sense, like taking Modafinil has something to do with transhumanism. In that case, it has been found and shown that taking vitamin C on a regular basis, in children, improves IQ scores with something like eight points, which is absolutely enormous I can tell you. Personally I am so convinced by the statistics shown, that every morning I take vitamin C, I eat kilo's of the stuff. Whether it works or not I'm so convinced by the statistics. But there are other links. We did some studies with a school, and the ethical people were really annoyed with it, where we gave the kids regular breakfasts, but some of them had cereals, some of them had toast, some of them had meat, bacon. Because they're various anthropological studies that have theorised that our brain started developing quickly at one time, when we started eating meat. Low and behold, sure enough, over a couple of months the ones who ate bacon sandwiches, their IQ score improved by 3 points. Everybody hated the study 'you can't publish things like that', all the vegetarian people just about killed me and so on. So its the sort of thing I was able to publish in a book, and then got criticism for not publishing it in a journal. There are all sorts of things, maybe even eating meat means you are a sort of transhumanist. It is not just Modafinil. An other interesting thing is that babies that have a dummy, grow up to have, on average, IQ scores 3 points less than people who don't. This is wonderful statistics! Whenever I see a baby in the streets, I go like 'please, please take that away!' Relatives get so annoyed with me, 'take that dummy, I can't bare to see it'. It is a logical thing, I mean, what the kid is trying to do is 'hey communicate with me, tell me things that I need to know', and parents shut them up. So it stops the kid communicating, which probably does have a serious impact, 3 points could mean you fail an exam whereas you could have passed, or you don't go to university, while you could have gone. If parents realise that just by this little dummy, they are having an easy life themselves, but they're making their kid stupid. But you start out in these things, they are cumulative. You put this dummy in your kid, you don't give it vitamin C, and so it goes on, you live in an environment with lots of lead poisoning, you're making your kid stupid, reducing opportunities. It is all those things, I think, in terms of transhumanism, maybe there are more everyday transhumanists by having vitamin C and bacon sandwiches and coffee, etc.

*13. Aubrey de Grey also wrote some things on caloric restriction. I wondered whether this caloric restriction, or even the quantified self could be considered, as you also said, to be transhumanism.*

Yes, I think it is, I mean it is a different way of looking at it, it is almost a tension to how I look at things. I quite enjoy listening to Aubrey, it always surprises me with some of the things, so it is a

tension, but I would still say that it is a different way. The chance of living forever, I guess my only feeling with that, yes I wouldn't mind living forever, as long as I'm healthy. My mother had dementia, and one of the things we're trying to do with a little rat brain bot, is figuring out how memories work and can we add neurones to keep memories and so on. Because it is horrific, and I wouldn't want to live one year, one day, with dementia. Never mind, I don't want to live 300 years with dementia. So you live sort of 70 years normal and then you're going to live forever, so you will have the next 400 years living with dementia. It's a horrific problem and a lot of the age related diseases, Parkinson's is another one, they're not pleasant neurological diseases. I wouldn't mind living forever as long as I'm healthy. At least for the first 600 years, that I could be healthy, sexually as well would be nice (laughs). Then maybe the last few months before I die, when I'm 615, the last three months I can be unhealthy, that's probably ok. I could put up with that. I want the first 615 years to be good and to chill out and to have a glass of wine when I want, intellectually top of the game, and that sort of thing.

*14. It is funny that you say that, I saw a comment online on the idea of caloric restriction, because Aubrey de Grey stated that you would probably only gain two or three years extra, and one person said that he did not see the value in starving yourself to only gain two or three years.*

That is a problem, I don't think I would go for that. So you die when you are 613 instead of when you're 615. Just think of all the things you could have done in those years! (laughs)

*15. You already mentioned that the Internet has had an immense effect on the possibilities and the expectations concerning transhumanism, do you also think that this has caused some increase in the diversity. For example you now see that something like biogerontology now has its own magazine and their own website. It seems as if they start to get their own community.*

All I can do is agree with you. I mean you're young, how old are you, 21 or something. If I could stay and look like that for 613 years... (laughs). The Internet has been such a dramatic change, the web or what someone wants to call it. In such a very short space of time. Even if you look back, I do quite a bit of work with the Turing test, can machines pretend to be human and so on. He predicted a lot 60 years ago on computers and the power, even before the computers were around, but what he didn't predict at all was the power of the Internet. Now the Internet of things, it is not just people, it is technology talking to it. There are also all sorts of dangers connected to that, but it has changed things dramatically and in the experiments that I did I have to say, you sort of do an experiment and I think I know, I'm confident that it is going to work, until you actually do it, if it has never been done before, you'd really don't know. People afterwards can say 'oh yeah well you

knew that that was going to...’, but you didn’t really, because you try something and you hope it works. And sometimes it does, sometimes it doesn’t and you keep quiet about that (laughs). But when it actually works, and the one time I went to New York and they plugged my nervous system into the Internet and I controlled a robot arm here in England, I’d only been thinking about it technically. Ok we should be able to do this, it’s just like telephone messages, it is the same thing, only this is brain signals, not speech signals, besides that we’re doing exactly the same thing. We did that and the night after we did that, I sort of well in English ‘fuck me’, what this actually means, that my brain was in New York and part of my body was in England and my brain was controlling this thing. It is something that hollywood, just hasn’t dealt with. And probably it is difficult with the visuals, you’re looking at the human, here is this human in one place. So for me one of the big things with, ultimately with transhumanism, is that your brain and your body, well who needs your body? I mean it is just a bloody waste. It’s a pain in the neck, you don’t need a neck! It’s a pain in the brain! You don’t really need the body, or your body can be whatever you want it to be. You can redefine your body every day. Great, for an old guy! You can redefine you, which I think we are seeing now with the whole issues of identity. On Facebook for example you can be who you want, but you have to realise that other people are also who they want. We have a granddaughter, she is twelve, and she is on Facebook, and she was like ‘there’s a boy I met’ and we immediately suspicious wise checked it out and said ‘hold on a minute!’ To be perfectly hones it was extremely suspicious. Eventually she listened to us. We did learn that this site guy, this site that purported to be a boy, has now changed completely. So it looked as though there was something going on behind it. It is that sort of thing that you realise that with the Internet it’s not just Turing’s ‘is this a machine or is this human’, it is what the hell is it that you are interacting with? Is it a person, is it ten people, is it a company, what’s going on here? I did a talk in second life years ago and in the audience there were about three or four, I must say, very attractive avatars, they were very nice. That’s how I felt ‘yeah she’s okay’, but this is an avatar! I thought. hold on a minute, this is an avatar and it looks very nice, but hell it could be anybody! And there was also an avatar that was a fat baldheaded guy, if you’re going to have an avatar surely you don’t want one like that, even if you are a baldheaded guy, you don’t want to be a fat baldheaded guy! Because my avatar is like, halve metallic it got a funny eye, it’s cool it’s green, metallic, silver, it really is a brilliant avatar. It is great you can be what you want to be, but I was worried about myself. Being taken in by the power of the visual, ‘this avatar looks alright’, what’s going on with me? ‘Kevin pull yourself together!’. Don’t know where I went with that... But here you go (laughs). But so is the Internet it changes things, there is identity, there is perception and intellectual capabilities etc.

*16. What is your personal goal in your work?*

I have a number... One is, very short term goals, communicating brain to brain, so bringing about thought communication. It's technically there, we just have to do it, and I want to be part of that. I think that it is one of those things, where technically I know that we can do it, We can send signals from brain to brain, what will that mean? how far will we be able to go? I don't know. It is one of those things where you really have to get this first experiment done, so I can receive signals from another persons brain and we can do simple coding, and it will be so simple it will be unbelievable. Simple coding system, that we say, right, there is some basic yes/no, red light/green light, simple signals, that they perceive the signals somewhere and I get to know are they looking at red light or green light. Just by signals directly from their brain, just like that. I've got the experiments all worked out. So that, I want to do that, so that we can then move on to the next step, cause in transhumanist philosophy you can talk about it, think about it, communicating by thought, but we need to get the first experiment done. I think I have then some simpler goals, working with the surgeons with Parkinson disease stimulators, we get some very good results using AI to predict and using it to learn what is happening in the brain and I think this could easily be a big breakthrough in that area. That maybe Parkinson's disease will be treated in a different way, we don't need to do that, we can do this. So that also... It is partly that if I get Parkinson's myself, when I am older, that I can say 'hey I don't need to worry about this!'. No, I think we can help people with things like that. So it is all different things. The culturing of braincells, putting them in a robot body. I'm more of a systems guy, so I like to put more and more braincells in and now get the pharmacy people that say 'no, we want to see what all the braincells are doing!', and I'm going 'no, let's put more and more in!'. So there is a little bit of an argument going on there. So having more powerful humans, using human braincells in a robot body. That is a different type of transhumanism, it is building things from the bottom up. I guess their issues is, can we retain some of the elements of humanity? This thing that we're building together, is it conscious? So we're trying to communicate with the things now. There is so much to do! I want to live until I'm 615! And even then I will still want a bit more. So yeah there is loads, it is so exciting the area, because there is so much we don't know. So that's about a tenth of what I want to do.

*17. You already mentioned it somewhat, but I was wondering whether you do this more or less for your own wellbeing or more for a greater good.*

Ah no, no (laughs). My university would like to hear for the greater good, but that is the official line, and it probably is for other people. But it is what turns me on. Some of it, I have to say, is for the greater good. Like the Parkinson's disease thing, I feel that we can achieve something, it's there.

So it is actually dealing with and tightening the knots and bolts on something. We almost have it, do some more and we can tick the box on this. Seeing how horrific that sort of problem is for people and we can for that, not the greater good, but that particular group, do something. If some of them or just one person has a better life, because of something we've done, with an electrical pulse you don't need to worry about it anymore, great! It is not the greater good, but seeing some good in that sense. Some people's lives can be made a bit more comfortable and a bit more palatable. You never know what they are going to come up with. So, that sort of thing. But generally it is pure scientific investigation. It is what excites me, what gets me going in the morning, apart from, I have a very attractive wife and she does as well, but it is that. That's the honest answer I'm afraid.

*18. I can imagine that moving a hand all the way across the Atlantic gives quite a kick.*

It's cool as well, yeah it's cool. I was excited, when I was a kid, about the sort of sensible science fiction *War of the Worlds*, *The Terminal Man*, that sort of things. Michael Crichton, I like Michael Crichton, that sort of science fiction. He is never very fashionable, but I like him. So it is sort of living, realistically living some of that science fiction, I think, that is for me excited. There is the fantasy science fiction, and I don't really like that. I mean the science fiction, based on where we are now, like Dr Jeckyll and Mr Hyde and that for me is brilliant stuff. I don't know whether I want to be Mr Hyde though (laughs).

*19. It is quite fascinating that so many things today were already predicted in science fiction decades ago.*

Oh yeah, authors like Jules Verne, people landing on the moon or even nuclear weapons and so on, there is so much that they, pretty accurately actually in some cases, described beforehand. So, a lot of Crichton stuff, something like Jurassic Park, hey it is fun for kids to watch, but hey could we do something like that? Maybe at the time that he wrote it it was speculating, but then you start to think maybe now with DNA, we can grow cells, maybe we could do something like that. It would be scary, but that is also the beauty of doing this, it is like getting on a roller coaster ride. You hope it does not come off the rails. A white knuckle ride, that is the beauty of the sort of research science, you are not sure. For example when we were doing the experiments, we were about to start pushing electric current down my nervous system, and the only time this particular implant was used before was with chickens, so you have no idea which current in the chicken is right, the chicken is not going to say 'hey that's a bit too much' or whatever. So we said how much are we going to put? We can just turn the dial... Yeah, that's a good question and I guess that was one of those things, and it sounds stupid, that we didn't really thought about. We got it all set up, but how

much current, that was a white knuckle ride. An electric current going in, your brain is going to be stimulated, or maybe, by this electric current. What are we going to turn it on? I don't know... (laughs).

*20. It was quite a risk, since you didn't know what the effects would be. For all you know you could be left with some phantom pain.*

To be honest, a few days before that implant went in, the surgeon Peter Teddy, we just quietly sat in a room and he said, look, you still have a few days to go, you really don't have to go ahead with this, you don't need the surgery and to be perfectly honest there is a good chance that you could lose the use of your hand because of this. Because there are all sorts of infections that can get in, statistically you have a five percent chance of getting an infection in and you would not be able to use your hand. With the electrodes going they could seriously damage your nerves, again could lose, at least some of the functions of your fingers. But also you will be pushing signals into your nervous system and your brain is picking up the signals. You know I am a scientist, I want to go ahead with it, I don't listen to that kind of stuff. But then subsequently, giving a talk at that hospital, but also at other hospitals, explaining what we did, surgeons and particularly neurosurgeons, said 'you pushed currents like that in your nervous system? Are you crazy?'. Exactly what you were saying, you start stimulating the brain directly, not via your senses, how is the brain going to react? You don't know. So I was told by a number of surgeons that I was absolutely crazy. They probably realised the dangers that I unfortunately didn't realise, or I wasn't too worried about it, I guess.

*21. That didn't give you trouble raising your kids, ignoring every advice and just doing what you want?*

(Laughs) No, well they were actually very sympathetic. I think they did were worried before. Especially my daughter was very worried, she talked to me just before the last implant went in, 'what are you doing this for, you don't have to, I don't want to lose you, I love you as a father', and I said look, it's me I have to do this.

*22. How does it actually feel to have so many people closely following your work, perhaps even in a sort of hopeful way for their future?*

Yeah, it seems to increase actually. I do get requests from a lot of people that they would like to be part of it. And it is difficult, at first when I would get one or two I would individually respond to them saying 'look, thank you, if the opportunity comes, but ethically there are all sorts of problems', but now there is no way if I responded to all the emails, just emails, never mind letters

of that type, I wouldn't do any work, that would be what I would do all day, respond to letters. So, it is not possible really that somebody needs to be part of it. But it is not nice, there is so much interest now in that. I guess on the other hand, and I guess Aubrey gets the same, you get some people, you know, that are negative. So, there's a website *The Register*, that for some reason does not like me at all. You just have to live with that, thick skin and put up with it. You are going to get criticisms because you have done something and they haven't. I don't think that it is because they don't understand, I think it's that they don't want to accept it. They probably go to dinner parties and like 'hey have you heard what this guy has done?' 'Yeah pfff'. It's a bit like that, so they try and rubbish it a little bit. You try talking, I think years ago I tried talking to a newsthesis reporter that was rubbishing my work, and I realised that he wasn't interested at all in what I was saying. So if it gets done and some people want to read it... I guess anybody, and Aubrey probably feels the same, is going to get that sort of thing, detractors or whatever.

*23. How do you feel about the other transhumanist dreams and approaches, such as mind uploading or biogerontology?*

Yeah, I think first of all that it is important to put the ideas out there, that people think about it, but I am a practical guy, let's say the minduploading, okay what do we mean practically, can we actually do anything along those lines? Can we try? I'm not saying we can't, but what work has been done in that area. So I guess in terms of what I think about it, it is good to have the ideas like that thrown around, so that people can discuss, but I'm very grounded by it and practically; where is experiment number 1, where are the results, where is experiment number 2. Have you done this minduploading with a cockroach? You know, where is the cockroach brain? Whatever way you want to do it, let's take part of the human brain and upload that into a computer so which part shall we do? Let's take your memory, can we do that? One element, just one memory? Just get that one memory of Anders Sandberg or Nick Bostrom, and put it in the computer. Get on with that, do that experiment. I have to say Ray Kurzweill, I think I annoy him, recently I was invited to this conference thing and he wouldn't talk on the same debating thing with me. So in the end not doing this thing at all, because he didn't want to talk to me. Because I'm constantly driving him and saying, well you talk about all this stuff, but you don't actually do any. Do something! You are talking about the changing, singularity, where are the practical results to show? Have an implant, see what it's like! But he doesn't like that, he prefers to talk about it, so I guess he is probably not the only one that doesn't like me. So my constant thing would be, let's do some experiment along the way, let's make it a practical thing.

*24. Something I could not find out about you on the Internet, while there is quite some information on it, is whether you are registered for cryonics?*

No, but I don't mind if you want to register me. No, I'm not, but which is interesting, since a lot of the braincells we get are frozen, we have to defrost it, so I can see the practicalities of it.

Transporting from place to place and with regard to time, it is quite useful. So yeah, I haven't really thought about it, I haven't had time to think about. It is interesting you are the first person to ask me, that is why it is not on the Internet. I might have to register, I'm not registered. But if it costs money, I would have to do some deal with them. I never really thought about it, I must say. Now I will, I will have a restless morning.

*25. What would your ultimate dream future be?*

Dream future, I don't know if it is a dream future, because I do see it actually happening, and that would be that we would all be greater humans with intellectual capabilities like communication way beyond those of humans. And what it means for the people that stay as ordinary humans, probably not good. So, I'm not sure whether it is a dream in the sense of a positive thing, what you really like, but a dream in terms of what I think will happen, would be that. There is a possibility in the Terminator scenario, that intelligent machines are taking over. So in a sense it is a dream scenario in that it says that humans will upgrade, in intellectual capability to stay in the driving seat. And I certainly want to be part of that, I do feel restricted, limited, by being a human intellectually. I can see how computers operate and work and I would love to have some of those capabilities. Whether I live forever with it or not is another question, just having those kind of abilities even for a short period of time, I would be quite happy with.

*26. And it wouldn't matter whether it would be a robotic body, or a human body?*

Robotic body would be better, because it could be anywhere and do anything. I don't think that because of how old I am and the rules and regs, that I in this body am ever going to get to Mars or Jupiter. But I can't see why I couldn't go in a robotic body. I think it would become a possibility and I would love to experience things like that.